MONITORING AND EVALUATION OF THE GLOBAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE

Framework and recommended indicators

ANNEX 3. Methodology sheets for recommended indicators

Food and Agriculture Organization of the United Nations

WORLD ORGANISATION FOR ANIMAL HEALTH

World Health Organization

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Version 1: as of September 2019

This document should be read in conjunction with the Monitoring and evaluation of the global action plan on antimicrobial resistance: framework and recommended indicators (https://www.who.int/antimicrobial-resistance/global-action-plan/monitoring-evaluation/tripartite-framework/en/)

These reference sheets will be updated regularly as necessary. Please review periodically for updated versions.

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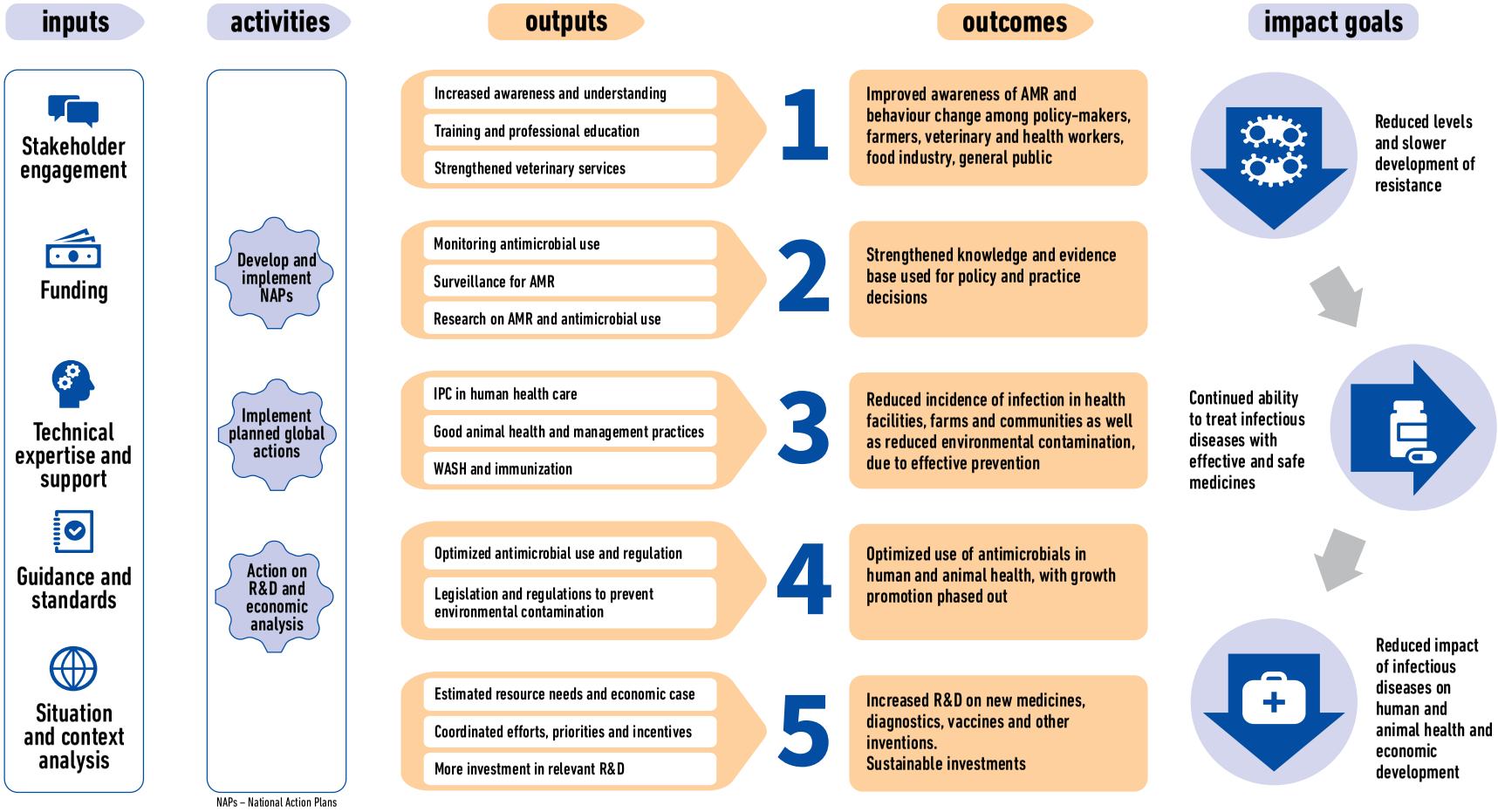
Fig. 1. The GAP results chain: mapping the causal pathways connecting the inputs, activities and outputs with the outcomes and impact goals



Source: WHO, FAO and OIE

SUPER GOAL: Reduced impact of infectious diseases

REFERENCE SHEET	
Indicator name and number 	**I: Impact of Infectious Disease** Burden of infectious disease in Disability Adjusted Life Years (DALYs)[a] per 100,000 population: a. For which antimicrobial treatment is usually required b. For TB HIV and Malaria
DESCRIPTION	
Definition/s	This indicator refers to the burden of infections that are treatable with antibiotics and is expressed in Disability Adjusted Life Years (DALYs) per 100,000 inhabitants. The indicator includes the major infections for which antibiotic use, is usually recommended (the list is not exhaustive, and there are some conditions for which antibiotics are occasionally indicated that are not included, and some relatively uncommon conditions that are not included). The table below contains a **preliminary** list of infections according the disease categories established by the Institute for Health Metrics and Evaluation (IHME) to evaluate the Global Burden of Disease (GBD).[1] These diseases are selected based on the common definition of antibiotics as antibacterial agents and therefore do not include viral and parasitic infections that are treated with antimicrobials other than antibiotics. The IHME global burden of disease has established disease categories on which the model is based. More work and expert discussion is required to finalize these categories . **A Diseases that should usually be treated with antibiotics** Lower bacterial respiratory infections • Pneumococcal pneumonia • H influenzae type B pneumonia • Other lower respiratory infections: Cholera Intestinal infectious diseases • Typhoid fever • Paratyphoid fever Meningitis Diphtheria Tetanus Maternal sepsis and other maternal infections Neonatal sepsis Sexually transmitted diseases excluded HIV (bacterial) • Syphilis • Chlamydial infection • Gonorrhea • Trichomoniasisa

[a] Disability Adjusted Life Years (DALYs) are a measure that combines deaths and disability due to a disease, giving an overall picture of the impact of each cause of disease/premature death. For further details and global and country estimates see http://www.healthdata.org/gbd/about

Definition/s	Endocarditis Interstitial nephritis and urinary tract infections Cellulitis Pyoderma infections N.B. The table does not include diseases for which antibiotics are used prophylactically (e.g. bite wounds, extensive burns and other physical injuries).
Disaggregation	*Disaggregation/additional dimension.* Data can be disaggregated by sex, age, cause and location based on sociodemographic index (SDI) through the GBD Results tool.[2] Data should also be split by causative agent. TB HIV and Malaria.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Global Burden of Disease (GBD) http://www.healthdata.org/gbd
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	WHO Burden of disease estimates for burden of TB, HIV and Malaria
Method of estimation	Extract data from global burden of disease database. This data is modelled on the basis of information from a wide range of datasets. Total burden of disease is the sum of the DALY attributable to each condition. Numerator: Disability Adjusted Life Years lost from disease usually treated with antibiotics. Denominator: Population –100 000.
Measurement frequency	Biennial
References	1 GBD 2015 cause list: www.healthdata.org/sites/default/files/files/Projects/GBD/GBDcause_list.pdf 2 GBD Results Tool: http://ghdx.healthdata.org/gbd-results-tool 3 GBD project (IHME website): www.healthdata.org/gbd

GOAL: Reduced levels and slower development of resistance

REFERENCE SHEET	
Indicator name and number 	**II a and b: Prevalence of blood stream infections** caused by the following: a: Methicillin-resistant *Staphylococcus aureus* (MRSA) b: Extended spectrum beta lactamase (ESBL) in *E. coli* – 3rd generation cephalosporin resistance as a proxy
DESCRIPTION	
Definition/s	Frequency of bloodstream infection among hospital patients due to methicillin-resistant *Staphylococcus aureus* (MRSA) and *Escherichia coli* resistant to 3rd-generation cephalosporin (e.g., ESBL- *E. coli*). Rational for selecting these two types of AMR: (i) *E. coli* and *S. aureus* are among the most common human fast growing bacteria causing acute human infections; (ii) *E. coli* is highly frequent in both humans, animals and environment, being an excellent indicator for monitoring AMR across the sectors in line with the One Health approach; (iii) both MRSA and ESBL- *E. coli* are largely disseminated and frequently in high frequency in hospital settings all over the world. Infections with these types of AMR lead to increase in use of the last resort drugs (e.g., vancomycin for MRSA infections, and carbapenems for ESBL- *E. coli*) against which new types of AMR are emerging. Effective control of these two types of AMR will ultimately preserve the capacity to treat infections with available antimicrobials while new prevention and treatment solutions can be developed. Bloodstream infections of hospital origin due to MRSA can also monitor the effectiveness of infection prevention measures in healthcare facilities, and hence WHO has defined relevant global infection prevention and control (IPC) standards and strategies.
Disaggregation	Data will be aggregated at the country level. Data will be analyzed and reported according to whether specimen is within 2 calendar days of admission (community origin) or after 2 calendar days of admission (hospital origin).
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	National AMR data collected through the national AMR surveillance system and reported Global Antimicrobial Resistance Surveillance System (GLASS)
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	Published and non-published data from national centers and research/academic institutions and from others regional surveillance networks
DATA COLLECTION	
Method of Measurement	Blood should be collected and cultured following national or international SOP. Antimicrobial susceptibility testing should be carried out according to internationally recognized standards (e.g. EUCAST and CLSI)

Method of estimation	The WHO Global AMR Surveillance System (GLASS) supports countries to implement an AMR standardized surveillance system. At national level, cases are found among patients from whom routine clinical samples have been collected for blood culture at surveillance sites according to local clinical practices, and antimicrobial susceptibility tests (AST) are performed for the isolated blood pathogens. The microbiological results (bacteria identification and AST) are combined with the patient data and related to population data from the surveillance sites. GLASS does collect information on the origin of the infection either community origin (less than 2 calendar days in hospital) or hospital origin (patients hospitalized for more than 2 calendar days). Data are collated and validated at national level and reported to GLASS where epidemiological statistics and metrics are generated. Numerator: Number of patients presenting with blood stream infection due to MRSA and ESBL- *E. coli* among patients seeking hospital care. Denominator: Number of patients seeking hospital care and from whom the blood specimen was taken due to suspected bloodstream infection and from whom blood specimens have been submitted for blood culture and AST.
Measurement frequency	Continuous with annual reporting
References	World Health Organization. Global Antimicrobial Resistance Surveillance System (GLASS) websites: http://www.who.int/glass/en/ http://www.who.int/gho/glass/en/ World Health Organization, 2015. Global Antimicrobial Resistance Surveillance System (GLASS). Manual for early implementation: http://apps.who.int/iris/bitstream/handle/10665/188783/9789241549400_eng.pdf?sequence=1 World Health Organization, 2010. WHO guidelines on drawing blood: best practices in phlebotomy: http://apps.who.int/iris/bitstream/handle/10665/44294/9789241599221_eng.pdf?sequence=1 European Committee for Antimicrobial Susceptibility Testing (EUCAST): http://www.eucast.org/ast_of_bacteria/ Clinical Laboratory Standards Institute (CLSI): https://clsi.org/standards/products/microbiology/

REFERENCE SHEET	
Indicator name and number 	**III a and b: Resistance in commensal *E. coli* from key food producing animals**, as follows: a: Percentage of *E.coli* isolates showing resistance to third generation cephalosporins (i.e. presumptive extended spectrum betalactamase producing *E.coli*) b: Patterns of resistance in *E.coli* to a defined panel of antimicrobials
DESCRIPTION	
Definition/s	**Key food producing species:** the terrestrial (including avian) animal specie(s) from which is/are produced the greatest amount of food for human consumption on a national basis. **Commensal *E.coli*:** Non type specific *E.coli* from the gastrointestinal tract of healthy animals either on farm or at the place of slaughter. **Resistance:** Resistance against an antimicrobial is considered to be present if the zone diameter or the minimum inhibitory concentration (MIC) exceeds the epidemiological cutoff value (EUCAST or CLSI definitions apply).
Definition/s	Defined panel of Antimicrobials (AMs):[a] • cefpodoxime alone or ceftazidime in combination with one of either cefotaxime or ceftriazone, • ciprofloxacin, • ampicillin, • tetracycline, • chloramphenicol, • gentamicin, • trimethoprim-sulfamethoxazole • nalidixic acid (optional), • colistin[b] (optional)
Disaggregation	Global data will be disaggregated by: • antimicrobials included in the susceptibility testing panel • animal species • geographical region (to country level) • type of sampling programme from which isolates obtained • methodological standard with which isolation and antimicrobial susceptibility testing (AST) comply
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	FAO Global platform for AMR data
Country Level Data Sources, if applicable	National surveillance programmes
Secondary data sources, if applicable	Targeted testing and screening programmes (government, research institute), Sentinel herds or flocks, Farm data (private or government veterinary public health laboratories)

[b] This list is broadly consistent with AGISAR and the Tricycle AST guidelines. However, countries are encouraged, where feasible, to also test additional antimicrobials as relevant to their national situation, including those that are used for veterinary treatment of clinical disease, (e.g. florfenicol). http://apps.who.int/iris/bitstream/handle/10665/91778/9789241506311_eng.pdf;jsessionid=BEE7A29A96C1B92590BBB208BEA521CB?sequence=1

[b] A joint EUCAST and CLSI subcommittee issued recommendations confirming that broth microdilution (BMD) is so far the only valid method accepted for AST of colistin.

DATA COLLECTION	
Method of Measurement	**Global** A: Number of *E coli* isolates showing resistance to 3rd generation cephalosporins (presumptive ESBL-producers) as a % of the total number of tested isolates collected from a random sample of animals. B: for each AM on the panel, the number of isolates exhibiting resistance, expressed as a % of the total number of isolates. **Country** Countries should submit data generated in accordance with the OIE Terrestrial Code (Chapter 6.7) and the OIE terrestrial Manual (Chapter 3.1).
Limitations (if applicable)	The need for AMR surveillance in isolates from a wider range of sources (aquaculture, food, environment) is recognized and it is considered that this indicator should be expanded in future to additional bacterial species and additional sources. Countries may need to use a variety of different sampling approaches initially, recognizing that this presents difficulties in terms of trend analysis. Initially passive or point prevalence surveys may need to be conducted/ relied on to access available data. Over time the expectation is that countries will move towards active systematic surveillance of key bacterial species, and this core data set will therefore strengthen. Countries are encouraged to apply the WHO Tricycle methodology where possible [to be published], as a common approach that facilitates harmonized data and facilitates comparison of data sets between sectors.
Measurement frequency	Annual country data submission to global platform
References	

[c] Country data collection may be continuous or intermittent depending on their sampling design

REFERENCE SHEET	
Indicator name and number 	**IV a: Patterns and trends in resistance in HIV, TB and malaria** a: Percentage of new bacteriologically confirmed pulmonary TB cases associated with rifampicin-resistant or multidrug-resistant Mycobacterium tuberculosis .
DESCRIPTION	
Definition/s	*New case:* a newly registered episode of bacteriologically confirmed pulmonary TB in a patient who, in response to direct questioning, reports never having been treated for TB or reports having taken anti-TB drugs for less than one month; or, in countries where adequate documentation is available, for whom there is no evidence of having taken anti-TB drugs for one month or more patients that have never been treated for TB or have taken anti-TB drugs for less than 1 month. *Rifampicin resistance (RR):* resistance to rifampicin detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether monoresistance, multidrug resistance, polydrug resistance or extensive drug resistance. *Multidrug resistance (MDR):* resistance to at least both isoniazid and rifampicin.
Disaggregation	Age group, sex, HIV status, geography (subnational areas).
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	WHO Global TB Report
Country Level Data Sources, if applicable	n/a
Secondary data sources, if applicable	n/a
DATA COLLECTION	
Method of Measurement	Molecular methods and phenotypic Drug Susceptibility Testing (DST) by liquid or solid culture should be performed according to the WHO Guidelines for surveillance of drug resistance in TB. The population to be tested should be drawn from a national representative sample of previously untreated bacteriologically confirmed pulmonary cases.
Method of estimation	Proportion of new TB cases with rifampicin resistance (or multidrug resistance) during the period of assessment. Estimation may be done through a national representative survey or using data from routine testing (so-called continuous surveillance) when the coverage of drug susceptibility testing exceeds 80% of newly diagnosed bacteriologically confirmed pulmonary cases over the period of estimation (typically a year). The indicator is presented with a best estimate and its uncertainty interval. The main sources of uncertainty are sampling uncertainty and missing data. Numerator: n/a Denominator: n/a
Measurement frequency	Annually in the case of continuous surveillance, every 3-5 years in the case of national surveys.
References	WHO Guidelines for surveillance of drug resistance in TB: http://apps.who.int/iris/bitstream/handle/10665/174897/9789241549134_eng.pdf?sequence=1 Global TB Report 2018: http://www.who.int/tb/data/en/ Multidrug-resistant tubercolosis (MDR-TB) indicators: http://apps.who.int/iris/bitstream/handle/10665/70484/WHO_HTM_TB_2010.11_eng.pdf?sequence=1 WHO Global Health Observatory visualizations. Indicator Metadata Registry: http://apps.who.int/gho/data/node.wrapper.imr?x-id=1366

REFERENCE SHEET	
Indicator name and number 	**IV b: Patterns and trends in resistance in HIV, TB and malaria** b: Percentage of malaria patients displaying treatment failure after antimalarial treatment during surveillance in selected sentinel sites (Therapeutic efficacy studies – TES)
DESCRIPTION	
Definition/s	*Antimalarial resistance:* ability of a parasite strain to survive and/or multiply despite the administration and absorption of a drug given in doses equal to or higher than those usually recommended but within tolerance of the subject. *Artemisinin partial resistance:* delayed parasite clearance following treatment with an artesunate monotherapy or with an ACT – this represents partial resistance. *Multidrug resistance (MDR):* resistance to more than 2 antimalarial compounds of different chemical classes. This term usually refers to P. falciparum resistance to chloroquine, sulfadoxine-pyrimethamine and a third antimalarial compound. *Treatment failure:* inability to clear parasites from a patient's blood or to prevent their recrudescence after the administration of an antimalarial. Many factors can contribute to treatment failure, including incorrect dosage, poor patient compliance, poor drug quality, and drug interactions and resistance.
Disaggregation	Positivity rate at day 3 during TES (surrogate of artemisinin partial resistance) Partner drug type, molecular confirmation of resistance mechanisms, resistance genotype.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	WHO Global Malaria Programme
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Therapeutic efficacy studies (TES) conducted as part of national malaria control programs in selected sentinel sites. Treatment outcomes (early treatment failure, late clinical failure, late parasitological failure or adequate clinical and parasitological response) are classified on the basis of an assessment of the parasitological and clinical outcome of antimalarial treatment according to the latest WHO guidelines. Recrudescence is distinguished from re-infection by polymerase chain reaction (PCR) analysis.
Method of estimation	No estimation. Data used for policy change are the outcomes of TES per site and per drugs. Numerator: Number of patients displaying treatment failure during TES Denominator: Number of patients treated for malaria during TES
Measurement frequency	Annually

References	Malaria drug resistance and response: www.who.int/malaria/areas/drug_resistance/en/ Tools for monitoring antimalarial drug resistance: www.who.int/malaria/areas/drug_resistance/efficacy-monitoring-tools/en/ Global database on antimalarial drug efficacy and resistance: www.who.int/malaria/areas/drug_resistance/drug_efficacy_database/en/ Global Report of Antimalarial Drug Efficacy and Drug Resistance 2002–2010: http://apps.who.int/iris/bitstream/handle/10665/44449/9789241500470_eng.pdf?sequence=1 World Malaria Report 2017: www.who.int/malaria/publications/world-malaria-report-2017/en/ Methods for Surveillance of Antimalarial Drug Efficacy: http://apps.who.int/iris/bitstream/handle/10665/44048/9789241597531_eng.pdf?sequence=1

REFERENCE SHEET	
Indicator name and number 	**IV c: Patterns and trends in resistance in HIV, TB and malaria** c: Patterns and trends in antiviral resistance in HIV: 1) Percentage of HIV positive individuals starting antiretroviral therapy with detected HIV drug resistance to antiretroviral drugs (prevalence of **pretreatment HIV drug resistance**) 2) Percentage of HIV positive individuals on antiretroviral therapy with virological failure and detected HIV drug resistance to antiretroviral drugs (prevalence of **acquired HIV drug resistance**)
DESCRIPTION	
Definition/s	*Acquired HIV drug resistance (ADR):* resistance that develops when HIV mutations emerge due to viral replication in individuals receiving ARV drugs. *Pretreatment HIV drug resistance (PDR):* resistance detected in ARV drug-naive people initiating antiretroviral therapy or people with prior ARV drug exposure initiating or reinitiating first-line antiretroviral therapy.
Disaggregation	Frequency of individual drug resistance associated mutations; reduced susceptibility to any ARV drug and ARV drug class [non-nucleoside reverse transcriptase inhibitor (NNRTI); nucleoside reverse transcriptase inhibitor (NRTI); Protease inhibitors (PI) , Integrase inhibitors (INSTI); age; gender; type of ART regimen in use; prior exposure (and type of exposure) to ARV drugs, geography (subnational areas).
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	WHO Global HIV Drug Resistance Report
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	Progress Report of the Global Action Plan on HIV drug resistance.
DATA COLLECTION	
Method of Measurement	Genotyping of protease (PR) and reverse transcriptase (RT) of the pol gene using RT–polymerase chain reaction (PCR) of RNA extracted from plasma or dried blood spots , followed by standard bulk sequencing techniques in one of the WHO HIVDR designated HIVResNet laboratories. The population to be tested should be drawn from a national representative sample of people starting ART (pretreatment HIV drug resistance survey) and from a national representative sample of people on ART with confirmed virological failure (acquired HIV drug resistance survey).
Method of estimation	Proportion of individuals starting ART with detected HIVDR (pretreatment HIVDR survey); proportion of people on ART with virological failure and detected HIVDR (acquired HIV drug resistance survey). Estimation is done through a cross-sectional, national representative survey using two-stage cluster design; the survey lasts typically 3-6 months. The indicator is presented with a best estimate and its uncertainty interval. The main sources of uncertainty are sampling uncertainty and missing data. Numerator: n/a Denominator: n/a
Measurement frequency	Every 3–5 years

References	Global action plan on HIV drug resistance 2017–2021: http://apps.who.int/iris/bitstream/handle/10665/255883/9789241512848-eng.pdf?sequence=1 HIV Drug Resistance Report 2017: http://apps.who.int/iris/bitstream/handle/10665/255896/9789241512831-eng.pdf?sequence=1 World Health Organization, 2014. Pretreatment HIV drug resistance concept notes: http://apps.who.int/iris/bitstream/handle/10665/112801/9789241507073_eng.pdf?sequence=1 World Health Organization, 2014. Acquired HIV drug resistance concept notes: http://apps.who.int/iris/bitstream/handle/10665/112802/9789241507196_eng.pdf?sequence=1

Outcome 1: Improved awareness of AMR and behaviour change among policy-makers, farmers, veterinary and health workers, food industry and the general public

REFERENCE SHEET	
Indicator name and number 	**1.1: Awareness of key groups** Percentage of stakeholders (e.g. human and animal health workers, prescribers, farmers, food processing workers) that have knowledge about AMR and implications for antimicrobial use & infection prevention (metrics TBD).
Methodology to be developed. Will be published at a later stage.	
DESCRIPTION	
Definition/s	
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	
References	

Outcome 3: Reduced incidence of infection in health facilities, farms and communities as well as reduced environmental contamination, due to effective prevention

REFERENCE SHEET	
Indicator name and number 	**3.1: Quality of care** Incidence of surgical site infections (SSI) following inpatients surgical procedures.
DESCRIPTION	
Definition/s	SSI as defined by the CDC National Healthcare Safety Network (NHSN) and by the 2018 World Health Organization (WHO) Protocol for surgical site infection surveillance with a focus on settings with limited resources, including those caused by the following resistant organisms: a: Methicillin-resistant *Staphylococcus aureus* (MRSA) b: % of carbapenem resistance in enterobacteriaceae – *E.coli*, *Klebsiella* c: Extended spectrum beta lactamase (ESBL) in *E. coli*
Disaggregation	Age, sex, elective or emergency surgical procedure, timing and type of antibiotic for surgical antibiotic prophylaxis, American Society of Anesthesiologists score, duration of the operation and wound contamination class, site of infection and type of SSI (superficial, deep, organ/space).
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	National and hospital surveillance system. NOTE: Data on the incidence of SSI should be supplemented with data on Blood-stream Infections (BSI) of hospital origin due to Methicillin-resistant *Staphylococcus aureus* (MRSA) that is being collected under Core Indicator II (Patterns and trends in resistance in human health).
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Prospective direct surveillance.
Method of estimation	1. Assessment of patient wound, review of patient medical records and microbiology reports, including post-discharge up to 30 days or 1 year. 2. Screening for readmission and/or return OR 3. Other information, such as coded diagnoses, coded procedures, operative reports or antimicrobials ordered. Numerator: Number of SSI episodes Denominator: Total number of inpatient surgical procedures and/or total number of surgical patients

Measurement frequency	Continuous with yearly reporting.
References	World Health Organization (WHO), 2018. Protocol for surgical site infection surveillance with a focus on settings with limited resources: http://www.who.int/infection-prevention/tools/surgical/evaluation_feedback/en/ Center for Disease Prevention and Control (CDC), 2018. Surgical Site Infection (SSI) Event: https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf World Health Organization, 2016. Global guidelines for prevention of surgical site infections: http://apps.who.int/iris/bitstream/handle/10665/250680/9789241549882-eng.pdf?sequence=1 World Health Organization, 2016. Guidelines on core components for hospital infection prevention and control programmes: http://apps.who.int/iris/bitstream/handle/10665/251730/9789241549929-eng.pdf?sequence=1 European Center for Disease Prevention and Control (ECDC), 2017. Surveillance of surgical site infections and prevention indicators in European hospitals – HAISSI protocol: https://ecdc.europa.eu/en/surgical-site-infections

REFERENCE SHEET	
Indicator name and number 	**3.2: Immunization coverage** Percentage of the target population that has received the last recommended dose of the basic series for each of the following vaccines: i: pneumococcal conjugate vaccine (PcV), ii) rotavirus vaccine, iii) measles-containing vaccine (MCV), either alone, or in a measles-rubella or measles-mumps-rubella combination, and iv) *Haemophilus influenzae* type B containing vaccine (Hib).
DESCRIPTION	
Definition/s	*Immunization:* the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.
Disaggregation	Age, place of residence, sex, socioeconomic status (from surveys only). Administrative data is available from 2nd subnational level.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	National population-based survey, routine facility information system, nominal electronic immunization registries.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Administrative reports from countries where the number of individuals in the target group that has received each vaccine is the numerator and the target population is the denominator or household surveys. Based on this data , WHO and UNICEF annually produce Estimates of National Immunization Coverage time series.
Method of estimation	For survey data, the vaccination status of children aged 12–23 months is used for vaccines included in the infant immunization schedule, collected from child health cards or, if there is no card, from recall by the caretaker. Numerator: The number of individuals in the target group for each vaccine that has received the last recommended dose. If coverage is measured by administrative system, surviving infants for antigens recommended before 1st birthday; children in targeted cohort for measles containing vaccines In case of coverage measured by survey, this would be the number of children aged 12–23 months in the sample who have received the specified vaccinations before their first birthday and in corresponding cohort for vaccines administered beyond first year of life. Denominator: The total number of individuals in the target group for each vaccine. For vaccines in the infant immunization schedule, this would be the total number of infants surviving to age one. In case coverage is measured by survey, it would be the total number of 12–23 months of infants in the sample.
Measurement frequency	In most countries annual tracking through facility information systems, supplemented by periodic household surveys.

References	Global Reference List of 100 Core Health Indicators 2018: http://apps.who.int/iris/bitstream/handle/10665/259951/WHO-HIS-IER-GPM-2018.1-eng.pdf?sequence=1 Countdown to 2015. Monitoring maternal, newborn and child health: understanding key progress indicators: http://apps.who.int/iris/bitstream/10665/44770/1/9789241502818_eng.pdf Sustainable Development Goals indicators definitions, rationale, concepts and sources. In: United Nations Sustainable Development Goals [website]. New York (NY), United Nations 2017: https://unstats.un.org/sdgs UNICEF Data: Monitoring the Situation of Children and Women. New York (NY): United Nations International Children's Emergency Fund (UNICEF) 2017: https://data.unicef.org World health statistics 2017: http://apps.who.int/iris/bitstream/10665/255336/1/9789241565486-eng.pdf?ua=1 WHO UNICEF coverage estimates (methods and data): http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index4.html

REFERENCE SHEET	
Indicator name and number 	**3.3: Access to safe water** Proportion of population using safely managed drinking-water services (SDG 6 Indicator).
DESCRIPTION	
Definition/s	Population using an improved drinking water source (piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tube wells; protected dug wells; protected springs, rainwater, packaged or delivered water) which is located on premises, available when needed, and free of faecal and priority chemical contamination.
Disaggregation	Place of residence (urban/rural)
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	National population-based surveys, population census, data from administrative sources or regulatory frameworks, utilities.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	The indicator is computed as the ratio of the number of people who use a safely managed drinking-water service, for urban and rural areas, expressed as a percentage. Data from household surveys or censuses provide information on the types of improved drinking-water sources listed above. Such data will be combined with water quality data from direct testing of water quality at the household level, with data on water accessibility and availability coming from both household survey and administrative records or regulatory frameworks. The percentage of the total population using a safely managed drinking-water service is the population-weighted average of the previous two numbers. The survey questions and response categories pertaining to the use of basic drinking-water sources are fully harmonized between DHS and MICS. Data coming from other household surveys are harmonized with the standard definitions in country files available on the WHO/UNICEF Joint Monitoring Programme on Water Supply and Sanitation website, accessible at http://www.washdata.org.
Method of estimation	The JMP assembles, reviews and assesses data collected by national statistics offices and other relevant institutions including sectoral authorities. A linear regression, modified according to some JMP rules, is used to provide estimates of the population using improved drinking water supplies, as well as the proportion of improved supplies which are accessible on premises, available when needed, and free from contamination. Regression is restricted to the years 2000 to present. Since data on accessibility, availability and quality is not generally available from the same datasets, the estimates resulting from independent regressions are combined. The indicator is calculated if at least two of the three elements can be estimated (and one of which need to be quality) by taking the minimum of the three elements (accessibility, availability, quality) and multiplying this by the estimate of the population using improved water supplies). A detailed methodological note is available on www.washdata.org. Numerator: Population using safely managed drinking-water services Denominator: Total population
Measurement frequency	Biennial

References	World Health Organization 2018. Global Reference List of 100 Core Health Indicators: http://apps.who.int/iris/bitstream/handle/10665/259951/WHO-HIS-IER-GPM-2018.1-eng.pdf?sequence=1 https://unstats.un.org/sdgs/metadata/files/Metadata-06-01-01.pdf WHO /UNICEF Safely managed drinking water services – JMP thematic report on drinking water: https://washdata.org/sites/default/files/documents/reports/2017-07/JMP-2017-tr-smdw.pdf

REFERENCE SHEET	
Indicator name and number 	**3.4: Access to sanitation** Proportion of population using safely managed sanitation services (SDG 6 indicator).
DESCRIPTION	
Definition/s	Population using an improved sanitation facility (flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets) that is not shared with other households and where excreta are safely disposed of in situ or treated off site.
Disaggregation	Place of residence (urban/rural) Also: population with handwashing facility with soap and water • Definition: population with basic handwashing materials in the home, including a handwashing facility, soap and water. Numerator: population with basic handwashing materials in the home. Denominator: total population.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	National population-based surveys, population census, data from administrative sources or regulatory frameworks, utilities.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	The indicator is computed as the ratio of the number of people who use a safely managed sanitation service, for urban and rural areas, expressed as a percentage. Data from household surveys or censuses provide information on the types of improved sanitation facilities listed above. Data on sewerage will be combined with data on wastewater treatment (secondary treatment) and data on onsite sanitation facilities with information on faecal sludge management (containment, emptying, transport, treatment). Resulting proportions will be summed up to obtain the safely managed sanitation indicator. The percentage of the total population using a safely managed sanitation service is the population-weighted average of the previous two numbers. The survey questions and response categories pertaining to the use of basic drinking-water sources are fully harmonized between DHS and MICS. Data coming from other household surveys are harmonized with the standard definitions in country files available on the WHO/UNICEF Joint Monitoring Programme on Water Supply and Sanitation website, accessible at http://www.washdata.org. *Handwashing:* The indicator is calculated using data from censuses and household surveys.

Method of estimation	Sanitation: The JMP assembles, reviews and assesses data collected by national statistics offices and other relevant institutions including sectoral authorities. Linear regression, modified according to JMP rules, is used to provide estimates of the population using improved sanitation facilities, as well as the proportion of improved facilities which are shared by multiple households. Separate regressions are made of the proportion of sewage waste which received at least secondary treatment, the proportion of wastes from on-site systems which are transported off-site and receive at least secondary treatment or are safely disposed of in situ. Regression is restricted to the years 2000 to present. Since data on use of sanitation facilities and treatment of faecal wastes are not generally available from the same datasets, the estimates resulting from independent regressions are combined. The indicator is calculated by multiplying the estimate of the population.
	using sewer connections by the proportion of sewage treated, doing the same for on-site sanitation (removed offsite and disposed of in situ), and combining the three figures A detailed methodological note is available on www.washdata.org. *Handwashing:* the indicator is estimated at urban/rural level considering the proportion of households having access to handwashing facilities with water and soap. National estimate is calculated with a weighted average. Regression is restricted to the years 2000 to present. Numerator: Population using safely managed sanitation services Denominator: Total population
Measurement frequency	Biennial
References	World Health Organization 2018. Global Reference List of 100 Core Health Indicators: http://apps.who.int/iris/bitstream/handle/10665/259951/WHO-HIS-IER-GPM-2018.1-eng.pdf?sequence=1 World Health Organization and United Nations Children's Fund 2017. Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines: https://www.unicef.org/publications/files/Progress_on_Drinking_Water_Sanitation_and_Hygiene_2017.pdf Sustainable Development Goals indicators definitions, rationale, concepts and sources. In: United Nations Sustainable Development Goals [website]. New York (NY): United Nations; 2017 (https://unstats.un.org/sdgs/, accessed 20 July 2017). Thematic report on safely managed sanitation (forthcoming). UNICEF Data: Monitoring the Situation of Children and Women. New York (NY): United Nations International Children's Emergency Fund (UNICEF); 2017 (https://data.unicef.org/, accessed 10 October 2017). WASH in the 2030 agenda: new global indicators for drinking water, sanitation and hygiene. World Health Organization and United Nations Children's Fund; 2017 (https://washdata.org/report/jmp-2017-wash-in-the-2030-agenda, accessed 11 August 2017).

REFERENCE SHEET	
Indicator name and number 	**3.5 a: Environmental standards** a: Number of State parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement. (SDG indicator 12.4.1)
DESCRIPTION	
Definition/s	The indicator refers to the number of parties (=countries that have ratified, accepted, approved or accessed), to the following Multilateral Environmental Agreements (MEAs): 1. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention); 2. The Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade (Rotterdam Convention); 3. The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention); 4. The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol); 5. Minamata Convention on Mercury (Minamata Convention). Which have submitted the information to the Secretariat of each MEA, as required by each of the agreements. The information required is as follows: **Basel Convention:**[a] 1. Designation of the Focal Point and one or more Competent Authorities; 2. Submission of the annual national reports. **Rotterdam Convention:** 1. Designation of the Designated National Authority(-ies) and Official contact points; 2. Submission of the import responses.
	Stockholm Convention: 1. Designation of the Stockholm Convention official contact points and national focal points; 2. Submission of the national implementation plans; 3. Submission of the revised national implementation plan addressing amendments; 4. Submission of the national reports. **Montreal Protocol:** 1. Compliance with reporting requirements for production and consumption of ozone-depleting substances under (Article 7 of) the Montreal Protocol; 2. Submission of information on Licensing systems under (Article 4B of) the Montreal Protocol. **Minamata Convention:** 1. Designation of a national focal point for exchange of information under Article 17 of the Convention; 2. Submission of national reports as required under Article 21 of the Minamata Convention.
Disaggregation	The indicator is available at country level. It is disaggregated by Convention, in addition to providing the average transmission rate of the five Conventions.

[a] The parameters presented below are based on the obligations of the Parties to transmit information to the Secretariat, whatever its national circumstances. Other information that only needs to be communicated to the Secretariat based on national circumstances, such as a possible national definitions of hazardous wastes, possible article 11 agreements under the Basel Convention, or a possible exemptions under the Stockholm Convention would not be included, either because the Secretariat is not in a position to assess whether the obligation to transmit information has materialized itself, or because Parties have the right not to make use of a right.

DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	**Description:** 1. Basel Convention: national focal points, electronic reporting system for annual national reports; 2. Rotterdam Convention: official contact points, PIC circular for import responses; 3. Stockholm Convention: official contact points; electronic reporting system for national reports every four years, National Implementation Plans; 4. Montreal Protocol: national focal points; 5. Minamata Convention: national focal points. **Collection process:** Data is collected by the Secretariat of the Basel, Rotterdam and Stockholm Conventions from Focal Points for the Basel Conventions, Official contact points for the Rotterdam Convention, official contact points for the Stockholm Convention, by the Ozone Secretariat from national focal points for the Montreal Protocol, and by the Secretariat of the Minamata Convention from national focal points for the Minamata Convention.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	**Computation Method:** In the following methodology, reporting is to take place in 2017 for the period 2010–2014, in 2020 for the period 2015–2019, in 2025 for the period 2020-2024 and in 2030 for the period 2025–2029. Reporting parameters include the following: The Country Score depends on the amount of information that is sent to the Conventions' Secretariat, and is calculated as follows (and communicated by the Secretariats): **Basel Convention:** 1. Designation of the Focal Point and one or more Competent Authorities (1 point); 2. Submission of the annual national reports during the reporting period (1 point per report). **Rotterdam Convention:** 1. Designation of the Designated National Authority(-ies) and Official contact point (1 point); 2. Submission of the import responses during the reporting period (0,2 point per import response). **Stockholm Convention:** 1. Designation of the Stockholm Convention official contact point and national focal point (1 points); 2. Submission of the national implementation plan (1 points); 3. Submission of the revised national implementation plan(s) addressing the amendments adopted by the Conference of the Parties within the reporting period (1 point per revised and updated plan);[b] **Montreal Protocol:** 1. Compliance with reporting requirements for production and consumption of ozone-depleting substances under (Article 7 of) the Montreal Protocol (15 points); 2. Submission of information on Licensing systems under (Article 4B of) the Montreal Protocol (5 points).

[b] Applicable to Parties bound by the amendments to the Stockholm Convention. Parties that are not bound by the amendments will by default receive one point for each such amendment.

<table>
<tr><td></td><td>
Minamata Convention:[c]
1. Designation of a national focal point (Article 17) (5 points);
2. Submission of national report (Article 21) (15 points).
<table>
<tr><th></th><th>Convention</th><th>Available Points (ap)</th><th>Points per year [p(t)]</th><th>Country Score (cs)</th></tr>
<tr><td>a</td><td>Basel Convention</td><td></td><td></td><td>[p(t1)]+[p(t2)]+[p(t3)]+[p(t4)]+[p(t5)]/ap</td></tr>
<tr><td>b</td><td>Rotterdam Convention</td><td></td><td></td><td></td></tr>
<tr><td>c</td><td>Stockholm Convention</td><td></td><td></td><td></td></tr>
<tr><td>d</td><td>Montreal Protocol</td><td></td><td></td><td></td></tr>
<tr><td>e</td><td>Minamata Convention</td><td></td><td></td><td></td></tr>
</table>
$$\text{Transmission rate} = \frac{(a_{cs} + b_{cs} + c_{cs} + d_{cs} + e_{cs})}{\text{N. of Conventions}} * 100$$
The final indicator will be a number expressed as percent, where 100% is the maximum degree of compliance with the reporting obligations of the MEAs to which a Country is a Party, and 0% the least degree of compliance with those obligations.
</td></tr>
<tr><td>Method of estimation</td><td></td></tr>
<tr><td>Measurement frequency</td><td>
Data collection:
1. First reporting cycle: 2017;
2. Second reporting cycle: 2020;
3. Third reporting cycle: 2025;
4. Fourth reporting cycle: 2030
</td></tr>
<tr><td></td><td>
Data release:
1. First reporting cycle: 2010–2014;
2. Second reporting cycle: 2015–2019;
3. Third reporting cycle: 2020–2024;
4. Fourth reporting cycle: 2025–2029.
</td></tr>
<tr><td>References</td><td>https://unstats.un.org/sdgs/metadata/?Text=&Goal=12&Target=12.4#foreword</td></tr>
</table>

[c] Please note that at the moment data is not available for the Minamata Convention. The timing of submission of reporting is not yet decided.

REFERENCE SHEET	
Indicator name and number	**3.5 b: Environmental standards** b: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment.
Methodology to be developed. The metadata available in this repository is a work in progress. It reflects the latest reference metadata information provided by the UN System and other international organizations on data and statistics for the Tier I and II indicators in the global indicator framework. Since Tier III indicators are still under methodological development, a link to the webpage that includes all available work plans is being provided. The repository will be further updated and periodically reviewed in cooperation with the respective data compilers. https://unstats.un.org/sdgs/metadata/?Text=&Goal=12&Target=12.4#foreword	
DESCRIPTION	
Definition/s	
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	
References	

Outcome 4: Optimized use of antimicrobials in human and animal health, with growth promotion phased out for animal use

REFERENCE SHEET	
Indicator name and number 	**4.1 a & b: Use of antimicrobials in humans** a: Total human consumption of antibiotics for systemic use (ATC J01) in Defined Daily Doses (DDD) per 1000 population (or inhabitants) per day b: The proportion of ACCESS antibiotics for systemic use, relative to total antibiotic consumption in DDD
DESCRIPTION	
Definition/s	Total human consumption of antibiotics for systemic use
Disaggregation	The proportion of ACCESS antibiotics for systemic use, relative to total antibiotic consumption in DDD. Distinction between Access, Watch and Reserve antibiotics (AwARe categorization) can be used as defined by the 2017 WHO Essential Medicine List (see references). Differentiation between level of care (community vs hospital) and between sector (public vs private). Sub-national data (by geographical area, e.g. disaggregated by state, region or province or by socio-economics stratus) are useful to study the heterogeneity of consumption within the country.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Import and domestic production. Distribution (wholesalers, central medical stores etc.) Please refer to the manual "WHO Program on Surveillance of Antimicrobial Consumption" for further information on data sources.
Country Level Data Sources, if applicable	Hospitals, pharmacies, insurance data
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Retrospective data collection.
Method of estimation	*Antibiotic Consumption* refers to estimates that are derived from aggregated data sources, mainly sales data, and serves as proxy for actual use of antibiotics. These data sources do not contain any information on the patients receiving the medicines or the indication of treatment, but can quickly provide an estimate on the quantity of medicines imported, sold or reimbursed at the national, subnational or local level that are useful for monitoring use over time. Data providers can identified along the medicines value chain from import/production to patient/user. Every year, data providers are requested to provide their respective consumption figures for the previous year. Numerator: Consumption of antibiotics for systemic use in DDD Denominator: Population under surveillance to which data apply

Measurement frequency	Annually
References	World Health Organization. WHO Model Lists of Essential Medicines (website): http://www.who.int/medicines/publications/essentialmedicines/en/ World Health Organization. WHO methodology for a global programme on surveillance of antimicrobial consumption. Version 1.0: http://www.who.int/medicines/areas/rational_use/WHO_AMCsurveillance_1.0.pdf?ua=1 EML 2017 Part III: Guidance for interpreting the AWaRe categorization of antibiotics for drug utilization studies

REFERENCE SHEET	
Indicator name and number 	**4.1 c: Use of antimicrobials in humans** c: Relative proportion of (access: watch: reserve antibiotics) for pediatric formulations
DESCRIPTION	
Definition/s	Proportion of Access-Watch-Reserve (AwARe antibiotics as defined by the 2017 WHO Essential Medicine List) for pediatric formulations.
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Import and domestic production. Distribution (wholesalers, central medical stores etc.). Please refer to the manual "WHO Program on Surveillance of Antimicrobial Consumption" for further information on data sources.
Country Level Data Sources, if applicable	Hospitals, pharmacies, insurance data, wholesalers
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Retrospective data collection.
Method of estimation	*Antibiotic Consumption* refers to estimates that are derived from aggregated data sources, mainly sales data, and serves as proxy for actual use of antibiotics. These data sources do not contain any information on the patients receiving the medicines or the indication of treatment, but can quickly provide an estimate on the quantity of medicines imported, sold or reimbursed at the national, subnational or local level that are useful for monitoring use over time. Data providers can identified along the medicines value chain from import/production to patient/user. Every year, data providers are requested to provide their respective consumption figures for the previous year. Numerator: Number of pediatric formulations on respectively Access, Watch, or Reserve (AWaRe) antibiotics. Denominator: Total number of pediatric formulations as unit or five day regiments.
Measurement frequency	Annually
References	World Health Organization. WHO Model Lists of Essential Medicines (website): http://www.who.int/medicines/publications/essentialmedicines/en/ World Health Organization. WHO methodology for a global programme on surveillance of antimicrobial consumption. Version 1.0: http://www.who.int/medicines/areas/rational_use/WHO_AMCsurveillance_1.0.pdf?ua=1 EML 2017 Part III: Guidance for interpreting the AWaRe categorization of antibiotics for drug utilization studies: https://adoptaware.org

REFERENCE SHEET	
Indicator name and number 	**4.1 d: Use of antimicrobials in humans** d: Percentage of hospital patients (adults and pediatric) receiving antibiotics according to AWaRe categories
DESCRIPTION	
Definition/s	Proportion of patients receiving an antibiotic and relative proportion of Access: Watch: Reserve: Other (AWaRe) antibiotics being used.
Disaggregation	Type of ward, medical or surgical division and adult vs pediatric.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Medical records and other patient notes (e.g. temperature charts, drug lists etc.).
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Cross-sectional Point Prevalence Survey (PPS)
Method of estimation	Cross-sectional PPS during which all inpatient (adult, pediatric and neonatal) wards are audited once within a fixed period of time. For patients receiving at least one antibiotic, mandatory data include the antibiotic substance prescribed, dose, , route of administration, and indication for treatment. If the WHO protocol on Point Prevalence Survey on antibiotic use in Hospitals is used, information on age, gender and comorbidities should be collected for all patients regardless of antibiotic treatment. Numerator: Number of patients on Access, Watch, Reserve or Other (AWaRe) antibiotics on the day of the Point Prevalence Survey (PPS) Denominator: Total number of patients in the ward on systemic antibiotics on the day of the PPS
Measurement frequency	Every 5–7 years at national level. Annually at hospital level.
References	WHO protocol on Point Prevalence Survey in Hospitals (under publication process)

REFERENCE SHEET	
Indicator name and number 	**4.2: Access to antibiotics** Percentages of health facilities that have a core set of relevant essential antibiotics available and affordable on a sustainable basis.
DESCRIPTION	
Definition/s	Proportion of health facilities that have a core set of relevant antibiotics available and affordable on a sustainable basis. An antibiotic is **available** in a facility when it is found in this facility by the interviewer on the day of data collection. An antibiotic is **affordable** when no extra daily wages (EDW) are needed for the lowest paid unskilled government sector worker (LPGW wage) to purchase a monthly dose treatment of this medicine after fulfilling basic needs represented by the national poverty line (NPL). **Daily dose of treatment (DDD)** is an average maintenance dose per day for a medicine used for its main indication in adults. **National poverty line (NLP)** is the benchmark for estimating poverty indicators that are consistent with the country's specific economic and social circumstances. NPLs reflect local perceptions of the level and composition of consumption or income needed to be non-poor. **Wage of the lowest paid unskilled government worker (LPGW)** is a minimum living wage that employees are entitled to receive to ensure overcome of poverty and reduction of inequalities.
Disaggregation	The proposed indicator allows for the following disaggregation: 1. public/private/mission sectors facilities (managing authority) 2. geography – rural/urban areas 3. facility type (pharmacy/hospital) 4. antibiotic type.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	The indicator relies on three data sources that have been used by countries to collect information on medicine prices and availability: 1. Health Action International Project supported by the WHO [HAI/WHO] 2. The Service Availability and Readiness Assessment survey [SARA] 3. The WHO Medicines Price and Availability Monitoring mobile application [EMP MedMon] *WHO Global Burden of Disease (BoD WHO)* – for generating medicine weights *WHO National Regulatory Authority (NRA) Maturity Levels* – for the quality of medicines correction factor *World Bank* – on the National Poverty lines *International Labor Organization (ILO)* – for the lowest paid government worker wage (LPGW)
Country Level Data Sources, if applicable	Routine facility information systems
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Service Availability and Readiness Assessment (SARA). The proposed methodology is similar to the WHO/HAI Methodology in which the following types of facilities are suggested for surveying in each country:• Capital Cities + administrative areas • Public facilities – CMS, Tertiary Hospital, District Hospital, PHC • Private – pharmacies• Mission – CMS, PHC Each country will choose the facilities to survey using a randomized sampling from the national master facility list. The collected information refers to the availability of the product TODAY and to the price-to-patient for the CHEAPEST available product.

Method of estimation	The indicator is computed as a multidimensional index with two dimensions: availability and affordability: 1. Availability of antibiotic is a binary variable: 1 – yes, available, 0 – no, not available. 2. A daily treatment of each antibiotic is affordable if its daily dose price is lower than the difference between the wage of the unskilled LPGW and the national poverty line (NPL) settled in a selected country. $\text{Extra daily wages (EDW)} = \frac{\text{NPL + price per DDD}}{\text{daily wage of LPGW}}$ 3. The two dimensions of access to antibiotics (availability and affordability) are combined into a multidimensional index applying union identification approach proposed by S. Alkire and G. Robles. In particular, selecting data for each facility separately, the availability and affordability data are combined into a single binary variable "access" assigning a value of '1' to each antibiotic that has both factors of availability and affordability satisfied and "0" otherwise. 4. Every antibiotic in the basket is weighted based on the burden of the disease(s) (DALYs) that are treated by this particular medicine. 5. Calculate weighted sum of antibiotics that are accessible (both available and affordable) in each facility. 6. Surveyed facilities are categorized as facilities that have the defined list of antibiotics simultaneously available and affordable versus facilities that do not, applying a threshold of 80% to the overall basket of antibiotics. 7. Compute proportion of facilities that have reached the 80% threshold out of the total number of surveyed facilities in a selected country using the following formula: $\text{SDG} = \frac{\text{Facilities with available and affordable antibiotics (n)}}{\text{Surveyed facilities (n)}}$ 8. Consideration of quality of the accessible medicines in the country using a proxy. The country level of medicine regulatory capacity assessed using the WHO NRA GBT is used as a proxy of the quality of the accessible medicines. The countries with a WHO Listed Authority (WLA corresponding to maturity level 3 and above) will be flagged to indicate the assured quality component. Numerator: Number of surveyed health facilities with the selected basket of antibiotics available and affordable per country Denominator: Total number of surveyed facilities per country
Measurement frequency	Annual
References	World Health Organization and Health Action International, Measuring medicine prices, availability, affordability and price components, 2nd Edition (Switzerland, 2008), available from http://www.who.int/medicines/areas/access/OMS_Medicine_prices.pdf World Health Organization, The Global Burden of Disease: 2004 Update (Switzerland, 2008), available from http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/ Alkire, S. and Robles, G. (2016). "Measuring multidimensional poverty: Dashboards, Union identification, and the Multidimensional Poverty Index (MPI)." OPHI Research in Progress 46a, University of Oxford. "Defined Daily Dose: Definition and general considerations" (WHO Collaborating Centre for Drug Statistics methodology, 07 February 2018), https://www.whocc.no/ddd/definition_and_general_considera/

Note: *Access to a core set of relevant essential medicines* is a CHI list and includes antibiotics (amoxicillin, ampicillin, ceftriaxone, gentamicin)

REFERENCE SHEET	
Indicator name and number 	**4.3: Appropriate use of antimicrobials** Percentage of inpatients surgical procedures with appropriate timing and duration of surgical antimicrobial prophylaxis (SAP).
DESCRIPTION	
Definition/s	*Appropriate timing* is defined as the administration of SAP prior to the surgical incision when indicated (depending on the type of operation) and within 120 minutes before incision, while considering the half-life of the antibiotic. *Appropriate duration* is defined as the discontinuation of SAP after completion of the operation.
Disaggregation	Region and hospital level, public vs private, type of facility, type of operation
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	Acute tertiary health care facilities.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Point-prevalence surveys. SSI surveillance including this indicator.
Method of estimation	TBD Numerator: Number of inpatients surgical procedures receiving SAP that meet the WHO recommendations on SAP timing. Number of inpatients surgical procedures receiving SAP that meet the WHO recommendations on SAP duration. Denominator: Total number of inpatient surgical procedures
Measurement frequency	Annually
References	World Health Organization, 2016. Global guidelines for prevention of surgical site infections: http://apps.who.int/iris/bitstream/handle/10665/250680/9789241549882-eng.pdf?sequence=1

REFERENCE SHEET	
Indicator name and number 	**4.4: Use in growth promotion** Percentage of veterinary AMs authorized /used for non-veterinary medical use (e.g. for growth promotion).
Domain	
DESCRIPTION	
Definition/s	Number of countries authorizing /using antimicrobial agents as growth promoters in animals.
Disaggregation	OIE Regions Economic status of the countries, according to the World Bank status.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE AMU database TrACSS
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	Annual
References	

REFERENCE SHEET	
Indicator name and number 	**4.5 a: Levels and trends in sales/imports/use of antimicrobials in food producing animals** a: Total volume of sales/imports (or use) (in mg/kg biomass) in food-producing animals.
DESCRIPTION	
Definition/s	Quantitative data reported on antimicrobial agents intended for use in animals adjusted for animal biomass.
Disaggregation	A second estimation of mg/kg additionally adjusted by country-level estimates of how much data on antimicrobial agents they covered for a specific year. Year OIE Region
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE AMU Database – For antimicrobial quantities: sales data with full coverage. For Animal Biomass: WAHIS and FAOSTAT.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Antimicrobial agents reported (mg) Denominator: Animal biomass (kg) Calculating the quantities of antimicrobial agents to report in kilograms: http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/A_AMUse_Final_Annex_to_Guidance_2017.pdf Animal Biomass estimation methodology: http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/Annual_Report_AMR_2.pdf
Method of estimation	
Measurement frequency	Annual
References	Terrestrial code – http://www.oie.int/en/standard-setting/terrestrial-code/access-online/ • AMU – Chapter 6.9. "Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals" Aquatic code – http://www.oie.int/en/standard-setting/aquatic-code/access-online/ • Chapter 6.3 – Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals

REFERENCE SHEET	
Indicator name and number 	**4.5 b: Levels and trends in sales/imports/use of antimicrobials in food producing animals** b: % of total sales/imports (or use) that are classified as the WHO Highest Priority Critically Important Antimicrobial Agents.
DESCRIPTION	
Definition/s	The percentage of kilograms of antimicrobials intended for use in animals that are classified as the WHO Highest Priority Critically Important Antimicrobial for Human Medicine (5th Revision).
Disaggregation	OIE Region By Antimicrobial Class
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE AMU Database – Sales data / import data.
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Total kilograms of Highest Priority Critically Important Antimicrobial Agents reported. Denominator: Total kilograms of antimicrobial agents reported. According to the WHO Highest Priority Critically Important Antimicrobial for Human Medicine (5th Revision).
Method of estimation	
Measurement frequency	Annual
Limitations (if applicable)	It is currently not feasible to collect all WHO Highest Priority Critically Important Antimicrobial classes through the OIE database on the use of antimicrobials in animals. The OIE will start collecting and interpreting the information for Quinolones, Glycopeptides and Macrolides.
References	Terrestrial code – http://www.oie.int/en/standard-setting/terrestrial-code/access-online/ • AMU – Chapter 6.9. "Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals" Aquatic code – http://www.oie.int/en/standard-setting/aquatic-code/access-online/ • Chapter 6.3 – Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals WHO Highest Priority Critically Important Antimicrobial for Human Medicine (5th Revision): https://apps.who.int/iris/bitstream/handle/10665/312266/9789241515528-eng.pdf?ua=1

REFERENCE SHEET	
Indicator name and number 	**4.6: Levels and trends in sales/use of pesticides used for the purpose of controlling bacterial or fungal disease in plant production** a: total amount of pesticide (active substance) intended for the purpose of repelling, destroying, or controlling bacterial or fungal disease (tonnes) b: % of the above total composed of each the following antimicrobial classes: aminoglycocides tetracyclines triazoles oxolinic acid
DESCRIPTION	
Definition/s	**Pesticide** means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating any plant growth (see the International Code of Conduct on Pesticide Management (http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/).
Disaggregation	Data will be disaggregated by the following pesticide classes: • Insecticides • Fungicide • Herbicide • Plant growth regulator • Rodenticide (http://www.fao.org/faoterm/en/) Data will be disaggregated by the following antimicrobial classes: • aminoglycocides • tetracyclines • triazoles • oxolinic acid Data will be disaggregated by country and/or region.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	FAOstat database (FAOstat is populated with country data submitted directly, e.g. by national government pesticide focal point).
Country Level Data Sources, if applicable	National Pesticide Regulatory Agencies Ministries of Agriculture, Environment and/or Public Health
Secondary data sources, if applicable	Industry association databases
DATA COLLECTION	
Method of Measurement	The total amount (tonnes) of all pesticide (active substance) sold/used for the purpose of controlling bacterial or fungal disease. The % of the total amount of pesticide (active substance) composed of the specified antimicrobial classes will be calculated as follows: $\frac{\text{pesticide (active substance) X class}}{\text{total}} \times 100$ Total amount of pesticide sold/used.

Measurement frequency	Annual
Limitations (if applicable)	It is recognized that limiting data collection to the selected classes of AM will not be a comprehensive data collection on all AM used to control bacterial or fungal diseases in plant protection; however the selected classes are considered to represent the most commonly used compounds used in plant production with AM activity. Given the vast number of different compounds used as pesticides, it is not considered feasible currently to collect data on all separate compounds, as this would represent a significant burden of reporting for countries.

REFERENCE SHEET	
Indicator name and number 	**4.7: Optimized antimicrobial use and regulation** Legislation or regulation requires that antimicrobials are only dispensed with a prescription from an authorized health worker.
DESCRIPTION	
Definition/s	
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey (TrACSS)
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Countries respond to the Tripartite Antimicrobial Resistance Country Self-assessment Survey (TrACSS). Number of countries responding positively to relevant sections question 5.4 of the country self-assessment questionnaire.
Method of estimation	
Measurement frequency	Annually
References	Global Monitoring of Country Progress on Antimicrobial Resistance (AMR): Tripartite AMR country self-assessment survey (TrACSS): https://www.who.int/antimicrobial-resistance/global-action-plan/database/en/

Outcome 5: Increased R&D on new medicines, diagnostics, vaccines and other interventions related to priority pathogens

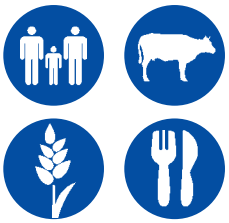
REFERENCE SHEET	
Indicator name and number 	**5.1 a & b: Global R&D pipeline** a: Number of new medicines in the R&D pipeline targeting products on the WHO priority pathogens list (antimicrobials and alternative treatments). b: Number of new diagnostic products in the R&D pipeline responding to the essential diagnostics list (released May 2018).
DESCRIPTION	
Definition/s	a: Medicines b: Diagnostics c: Vaccines: disease; vaccine type
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	WHO vaccine pipeline tracker WHO Observatory on Health R&D
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	Global R&D AMR Hub
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	Annually
References	http://www.who.int/medicines/publications/WHO-PPL-Short_Summary_25Feb-ET_NM_WHO.pdf http://www.who.int/medical_devices/diagnostics/WHO_EDL_2018.pdf http://drive-ab.eu/wp-content/uploads/2018/01/DRIVE-AB-Final-Report-Jan2018.pdf http://www.who.int/medicines/areas/rational_use/antibacterial_agents_clinical_development/en/ http://www.who.int/medicines/areas/rational_use/prioritization-of-pathogens/en/ http://www.who.int/immunization/research/vaccine_pipeline_tracker_spreadsheet/en/ http://www.who.int/research-observatory/monitoring/processes/antibacterial_products/en/

The information for this indicator will be collected managed at the global level only by WHO

REFERENCE SHEET	
Indicator name and number 	**5.1 c: Global R&D pipeline** c: Number of new Vaccines registered according to prioritisation (OIE reports on prioritisation of diseases for which vaccines could reduce antimicrobial use in pig, poultry and fish, 2015, and in cattle, sheep, and goats, 2018).
DESCRIPTION	
Definition/s	Cumulative number of new vaccines, targeting one of the pathogens listed as high or medium research priority by one of the OIE reports on prioritisation of diseases for which vaccines could reduce antimicrobial use in the different animal species, registered from the start of data collection for indicator 5.1 c. *New vaccine:* a monovalent vaccine having a new antigen component or a new multivalent vaccine, where a new or existing antigenic component is incorporated into an existing formulation containing other antigenic components. *Registered vaccine:* new vaccine registered for use in one or more countries. The registration of an existing vaccine in a new country should not be considered.
Disaggregation	Animal Species
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Health for Animals
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	Other unaffiliated pharmaceutical companies
DATA COLLECTION	
Method of Measurement	Survey: questionnaire sent to Health for Animals representatives to collect the aggregated data.
Method of estimation	Numerator: Cumulative number of new vaccines registered from the start of data collection for indicator 5.1 c. Denominator: Total number of pathogens listed as high or medium research priority for pig, poultry, fish, cattle, sheep, and goats (i.e. 86).
Measurement frequency	Annually
Considerations and Limitations (if applicable)	**Considerations and limitations:** • We are aware that this indicator is not able to capture some, possibly relevant, developments in vaccine technology (e.g. the production or use of new or improved adjuvants), as capturing information on these kinds of progresses would entail a higher risk of subjectivity in the calculation of the numerator and risk to ultimately bias the outcomes. It was then decided to focus on the registration of vaccines based on new antigen components, or of vaccines where a new or existing antigenic component is incorporated into an existing formulation containing other antigenic components. • We are aware that numerator could be higher than the denominator, as more than one vaccine could be produced against a same pathogen in one year, or vaccines against different strains could be registered.

	• We recognise that the denominator is unchanging, as the number of pathogens identified by the ad hoc Groups (AHG) is fixed. In addition, if an effective vaccine is produced against one of the priority pathogen, this might impact the antimicrobial use deriving from this specific pathogen, thus theoretically lowering the priority of such diseases. Nonetheless, until new assessment will be performed by OIE AHG, the denominator will not change. In addition, the registration of an effective vaccine against one pathogen would decrease the need for new vaccines for such disease; the number of new vaccines for this disease in the following years is then expected to be lower, which is why it was decided to use the cumulation of vaccines produced over the years instead that a yearly indicator. • We are aware that new vaccines could be produced by small companies, not being represented by Health for Animals. Nevertheless, since this organisation covers the vast majority of the vaccine production worldwide, the collected data would provide a useful insight of the situation at global level. • A disaggregation into animal species would be of interest, but it should be considered that the number of priority pathogen for some species (e.g. cattle) is much higher than for others (e.g. pigs).
References	

Outputs for outcome 1: Improved awareness of AMR and behaviour change among policy-makers, farmers, veterinary and health workers, food industry and the general public

REFERENCE SHEET	
Indicator name and number 	**1.a: Targeted awareness raising:** Nationwide, government supported AMR awareness campaign targeting priority stakeholder group(s) in the following sectors: a: human health b: animal health c: plant health d: food production e: food safety f: environment
DESCRIPTION	
Definition/s	**Stakeholders** are defined as people or groups of people who are interested in or affected by the issue. **Priority stakeholder groups** are those people who are not only interested in or affected by AMR but also are a target for awareness raising and behavior change initiatives because their beliefs and practices will have a greater impact on AMR risk than other groups. Evidence-based or risk-assessment based **prioritization of stakeholder groups** involves identifying stakeholder groups whose beliefs and practices will have a greater impact on AMR risk than other groups through a process that involves explicit consideration of documented risk factors.
Disaggregation	Analysis of country-level data with respect to sectors and overall stage of stakeholder assessment can be aggregated to regional and global level.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey (TrACSS).
Country Level Data Sources, if applicable	AMR national Steering Committee activity outputs / reports regarding stakeholder mapping, analysis and prioritization for action. AMR National Action Plan (NAP) Steering Committee can articulate whether the NAP process has involved processes to identify priority stakeholder groups through evidence and risk-based assessments. Ministry representatives on AMR NAP committee would be able to report in whether they have deployed communications initiatives in their sector.

Secondary data sources, if applicable	NGO or government program data. Professional association data generated from responses required for license renewal and/or from member surveys. Academic and grey literature studies.
DATA COLLECTION	
Method of Measurement	Number of countries indicating that awareness activities are conducted, and the extent of these activities, per sector via Q6.1 of the country self-assessment questionnaire.
Measurement frequency	Annual
Limitations (if applicable)	Communications experts may be underrepresented on AMR National Action Plan Steering Committees involving Ministry and technical experts. Recommend liaising with Ministry communications focal points for reporting on campaigns for respective sectors and whether stakeholder assessments have preceded these.

REFERENCE SHEET	
Indicator name and number 	**1.b: Strengthen Veterinary Services** a: Countries that in last 5 years have had a OIE. Performance of Veterinary Services (PVS) Pathways Activity (e.g. evaluation, gap analysis, follow up legislation or laboratory mission). b: Number of PVS Pathway missions within the last year globally.
DESCRIPTION	
Definition/s	A: Countries that in last 5 years have had Performance of Veterinary Services (PVS) Pathways Activity (e.g. evaluation, gap analysis, follow up, legislation, or laboratory mission). B: Number of PVS Pathway missions within the last year globally.
Disaggregation	By region, by national income
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE PVS Pathway reports
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	National Data
DATA COLLECTION	
Method of Measurement	Measurement: a: Number of PVS Pathway missions within the last year globally b: Manual/database search of PVS Pathway reports by OIE HQ
Method of estimation	Numerator a: Number of countries having engaged in a PVS Pathway activity (as defined above) within the last 5 years. b: Number of PVS Pathway missions within the last year globally Denominator: Number of OIE Member countries
Measurement frequency	
Considerations and Limitations (if applicable)	• One current limitation of the data sources is the lack of PVS Pathway reports database. However, the project has been initiated and a functional database should be available at the end of the year. Considerations for HR needed to feed the indicators will have to be well thought through. • The suggested timeframe between a PVS Evaluation and PVS Evolution Follow-up is 5 years. Typically, countries will have a PVS Gap Analysis and/or legislation, laboratory mission within those five years, although these capacity-building missions could also take place after a PVS Evaluation Follow-Up. • Using a 5-year timeframe for this indicator: as "5 years" represents the typical PVS Pathway cycle, a major yearly increase in the number of countries "having completed an activity within this 5-year timeframe" should not be expected. Maintaining the number of countries "having been involved in PVS Pathway activity in the last 5 years" over time would also be a positive outcome.

	• Suggestion for indicator B: To capture the level of active involvement of countries globally in the PVS Pathway (i.e. some countries may have multiple activities within 5 years, versus some only 1) in support of the strengthening of VS, another indicator may be more suitable: number of PVS Pathway missions within the last year globally (or ratio using number of member countries as a denominator).
References	OIE Tool for the Evaluation of Performance of Veterinary Services (013) © World Organisation for Animal Health https://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/AF-PVSTool.pdf

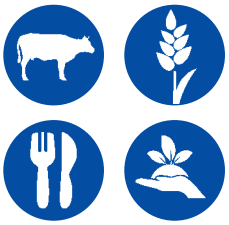
Outputs for outcome 2: Strengthened knowledge and evidence base is used to make policy and practice decisions

REFERENCE SHEET	
Indicator name and number 	**2.a: Data on AMR and AMU in humans** Countries that report to GLASS on: a: AMR in humans b: AMU in humans
DESCRIPTION	
Definition/s	Number of countries reporting data to GLASS according to the GLASS methodology.
Disaggregation	WHO regions Economic status of the countries, according to the World Bank status.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	GLASS
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Retrospective data collection.
Method of estimation	Calculation of proportions using the numerator and denominator below: Numerator: Number of countries reporting data Denominator: Number of WHO Member States
Measurement frequency	Annual
References	Global Antimicrobial Resistance Surveillance System (GLASS) at https://www.who.int/glass/en/ Surveillance of antimicrobial use at https://www.who.int/medicines/areas/rational_use/AMU_Surveillance/en/

REFERENCE SHEET	
Indicator name and number 	**2.b: Data on AMU in animals** Countries that report information on total quantities of antimicrobial agents sold for/imported for/ used in food producing animals.
DESCRIPTION	
Definition/s	Number of countries that report amounts (in kilograms) of antimicrobials intended for use in animals.
Disaggregation	OIE Regions Economic status of the countries, according to the World Bank status.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE AMU Database
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Calculating the quantities of antimicrobial agents to report in kilograms: http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/A_AMUse_Final_Annex_to_Guidance_2019.pdf
Method of estimation	
Measurement frequency	Annual
References	Terrestrial code – http://www.oie.int/en/standard-setting/terrestrial-code/access-online/ • AMU – Chapter 6.9. "Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals" Aquatic code – http://www.oie.int/en/standard-setting/aquatic-code/access-online/ • Chapter 6.3 – Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals

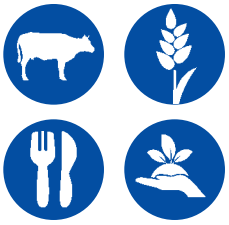
REFERENCE SHEET	
Indicator name and number 	**2.c: Data Reporting on AMU in animals** Countries that regularly report data on AM use in animals to OIE database, broken down by group of animals and administration route.
DESCRIPTION	
Definition/s	Number of countries able to distinguish amounts of antimicrobial agents by groups of animals and routes of administration.
Disaggregation	By OIE Region
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE Antimicrobial Use (AMU) database
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Group of animals and routes of administration ad defined on the OIE guidance: http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/A_AMUse_Final_Guidance_2017.pdf
Method of estimation	
Measurement frequency	Annual
References	Terrestrial code – http://www.oie.int/en/standard-setting/terrestrial-code/access-online/ • AMU – Chapter 6.9. "Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals" Aquatic code – http://www.oie.int/en/standard-setting/aquatic-code/access-online/ • Chapter 6.3 – Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals

REFERENCE SHEET	
Indicator name and number 	**2.d: Data on AMU in plants** Countries that have systems to collect and report information on quantity of pesticides used for the purpose of controlling bacteria or fungal diseases in plant production.
DESCRIPTION	
Definition/s	**Pesticide** means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating any plant growth (see the International Code of Conduct on Pesticide Management) (http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/).
Disaggregation	Data will be disaggregated by region and country
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey.
Country Level Data Sources, if applicable	National Pesticide Regulatory Agencies Ministries of Agriculture, Environment and/or Public Health
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	The number of countries that have indicated they are compliant with levels C or D of question 7.3 of the country self-assessment questionnaire.
Measurement frequency	Annual
Limitations (if applicable)	Previous responses to the country-monitoring questionnaire have demonstrated that few countries are systematically collecting any data specifically on pesticides used for controlling bacteria or fungi in plant production.

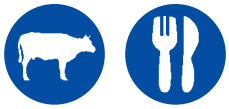
REFERENCE SHEET	
Indicator name and number 	**2.e.a: Food and Agriculture AMR laboratory network** a: Proportion, (%), of laboratories included in the national AMR surveillance system in the food and agriculture sectors with capacity to perform antimicrobial susceptibility testing and/or bacterial isolation and identification according to international standards.
DESCRIPTION	
Definition/s	The indicator is determined by measuring the number of the laboratories that are able to perform antimicrobial susceptibility testing and/or bacterial identification that are included in the national AMR surveillance system in the food and agriculture sectors against the number of all laboratories that are included in the national AMR surveillance system in the food and agriculture sectors. **Bacterial identification/isolation** refers to the ability to correctly isolate and identify/characterize bacteria to at minimum species level, and further if needed (e.g. serotype for *Salmonella*). Techniques used for the identification/characterization could range from biochemical tests to automated identification systems, proteomic profiling, and molecular biology, and they must be performed following good laboratory practices and in accordance with international standards and guidelines when they exist (e.g. ISO 6579 for Salmonella). **Antimicrobial Susceptibility Testing (AST)** refers at minimum to phenotypic techniques such as disk diffusion and minimum inhibitory concentration (MIC) methods. AST must be performed following international standards (CLSI, EUCAST, etc.) or national validated standards. AST results must be read at minimum by manual equipment (e.g. ruler, sliding caliper), and interpreted following international standards and guidelines (CLSI, EUCAST, etc.). **AMR surveillance systems** are standardized approaches to the collection, analysis and sharing of data on AMR, in order to inform decision-making, drive local, national and regional action, and provide the evidence base for action and advocacy done.[a] **Laboratories in the food and agriculture sectors:** refers to laboratories performing bacterial identification and AST of samples of animal (terrestrial and aquatic), food, plant or environmental origin. **Laboratories with capacity to perform AST and/or bacterial isolation and identification** refer to laboratories that are included in the national AMR surveillance system to monitor AMR in the food and agriculture sectors. Laboratories included in the national AMR surveillance system may contribute to surveillance activities by directly performing bacterial isolation, identification and AST, or by performing only one of these activities and providing the strains to the responsible laboratory for the AST. The laboratories have capacity to perform: • AST and bacterial isolation and identification or • AST and bacterial identification or • AST or • Bacterial isolation and identification or • Bacterial isolation.

[a] GLASS

Disaggregation	• Animal health – terrestrial animals • Animal health – aquatic animals • Plant health • Food safety • Environment
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	FAO Assessment Tool for Laboratories and AMR Surveillance System: FAO-ATLASS.
Country Level Data Sources, if applicable	FAO Assessment Tool for Laboratories and AMR Surveillance System (FAO-ATLASS).
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Number of laboratories performing antimicrobial susceptibility testing and/or bacterial identification following international standards Denominator: Total number of laboratories that are included in the national AMR surveillance system in the food and agriculture sectors NOTE: The indicator is suggested to be computed as a proportion (expressed in percentage) of the number of the laboratories that are able to perform antimicrobial susceptibility testing and/ or bacterial identification included in the national AMR surveillance system in the food and agriculture sectors over the number of all laboratories that are included in the national AMR surveillance system in the food and agriculture sectors. $\text{AMR laboratory capacity in food and agriculture sectors} = \frac{\text{Number of laboratories able to perform AST and/or bacterial identification included in the national AMR surveillance system in the food and agriculture sectors}}{\text{Number of all laboratories included in the national AMR surveillance system in the food and agriculture sectors}} \times 100$ For the estimation of the disaggregated dimensions, each of the five dimensions (1. Animal health – terrestrial animals, 2. Animal health – aquatic animals, 3. Plant health, 4.Food safety, and 5. Environment) should be taken separately e.g. for food safety. $\text{AMR laboratory capacity in food safety} = \frac{\text{Number of food safety laboratories able to perform AST and/or bacterial identification included in the national AMR surveillance system in the food and agriculture sectors}}{\text{Number of all food safety laboratories included in the national AMR surveillance system in the food and agriculture sectors}} \times 100$
Measurement frequency	Annual
Limitations (if applicable)	Countries reporting against this indicator will only be those that have undertaken ATLASS assessment.

REFERENCE SHEET	
Indicator name and number 	**2.e.b: Food and Agriculture AMR laboratory network** b: Robustness of the National AMR Laboratory network included in the AMR surveillance system for the food and agriculture sectors.
DESCRIPTION	
Definition/s	**AMR surveillance system:** refers to the national AMR surveillance system in place when present (please also refer to OIE Chapter 6.7. Terrestrial Animal Health Code, version 25/07/2017). AMR surveillance systems are standardized approaches to the collection, analysis and sharing of data on AMR, in order to inform decision-making, drive local, national and regional action, and provide the evidence base for action and advocacy done.[a] **Food and agriculture sectors** refer to animal health – terrestrial and aquatic animals, plant health, food safety, and environment.
Disaggregation	Data will be disaggregated at country and regional level
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey.
Country Level Data Sources, if applicable	Laboratories under the food and agriculture sectors included in the AMR surveillance system.
Secondary data sources, if applicable	FAO Assessment Tool for Laboratories and AMR Surveillance System: FAO-ATLASS.
DATA COLLECTION	
Method of Measurement	Tripartite AMR Country Self Assessment Survey (TRACCS) – Question 7.7: Scale from A to D measured through Tripartite AMR country self-assessment questionnaire. **Robustness of the National AMR Laboratory network:** The network is considered robust when reaching level C or D.
Measurement frequency	Annual
Limitations (if applicable)	Countries reporting against this indicator will only be those that have information regarding their National AMR Laboratory network.

[a] GLASS

REFERENCE SHEET	
Indicator name and number 	**2.f: AMR surveillance data in animals and food** Country collects and reports AMR surveillance data for: a: food producing animals (terrestrial and aquatic) b: i) food (animal origin) ii) food (plant origin)
DESCRIPTION	
Definition/s	Antimicrobial resistance surveillance data: results of antibiotic sensitivity tests performed on bacterial isolates. This indicator is intended to capture which countries are conducting any AMR surveillance in the above categories (food producing animals, foods of animal origin and foods of plant origin). To qualify a country must be conducting surveillance of resistance in one or more species of bacteria per category. For food producing animals and foods of animal origin this surveillance should be undertaken in accordance with the standards laid on in the OIE terrestrial code (chapter 6.8) or OIE aquatic code (chapter 6.4) and the OIE terrestrial manual (chapter 3.1). AMR surveillance of food of plant origin should be carried out in accordance with good laboratory practices and validated protocols.
Disaggregation	Data will be disaggregated by country/ region and by the following categories of bacteria: Surveillance in food producing species: A: Animal clinical isolates (terrestrial/ aquatic) B: Zoonotic bacteria C: commensal isolates Surveillance in food: A: food borne pathogenic bacteria B: indicator bacteria
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey.
Country Level Data Sources, if applicable	National surveillance reports Peer reviewed research publications Academia or Private laboratories
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Responses to questions 7.5a, b, c and d of the Tripartite AMR country self-assessment questionnaire. The number of countries that select each of responses A, B, or C to question 7.5b, and the number of countries that select each of responses A or B to question 7.5d for each category of food.
Measurement frequency	Annual

REFERENCE SHEET	
Indicator name and number 	**2.g: Prevalence of ESBL indicator *E.coli*** Country measures prevalence of ESBL producing commensal *E.coli* in key food producing species (terrestrial), in accordance with OIE Terrestrial code and OIE Terrestrial Manual
DESCRIPTION	
Definition/s	**Key food producing species:** the terrestrial (including avian) animal specie(s) from which is/are produced the greatest amount of food for human consumption on a national basis. **Target animals:** Animals (terrestrial, including avian species) destined for the food chain (or producing products destined for food chain) that are not at time of sampling within the applicable withdrawal period of an administered Veterinary Medicinal Product. **Commensal *E.coli*:** Non type specific *E.coli* obtained from the gastrointestinal tract of healthy animals either on farm or at the place of slaughter. **Prevalence of ESBL producing *E.Coli*:** number of isolates which produce extended spectrum betalactamase,[a] compared against the total number of isolates from the population sampled.
Disaggregation	Global Data will be disaggregated at country and regional level.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey.
Country Level Data Sources, if applicable	National surveillance programme.
Secondary data sources, if applicable	Targeted testing and screening programmes (government, research institute), Sentinel herds or flocks, Farm data (private or government veterinary public health laboratories).
DATA COLLECTION	
Method of Measurement	Responses to question 7.5b of the Tripartite AMR country self-assessment survey. Countries that confirm they are monitoring the prevalence of ESBL producing *E.coli* in priority species in accordance with OIE standards (*OIE Terrestrial code* chapter 6.7 and *OIE Manual* chapter 3.1) will be considered to fulfil this indicator.
Measurement frequency	Annual

[a] Those which demonstrate resistance to an extended spectrum penicillin (either phenotypical or genotypically) via a methodology conducted in accordance with internationally recognized standards.

REFERENCE SHEET	
Indicator name and number 	**2.h: Use of AMR surveillance data** National body reviews information from national AMR surveillance programmes, and makes and implements recommendations accordingly.
DESCRIPTION	
Definition/s	**Antimicrobial resistance surveillance data:** results of antibiotic sensitivity tests performed on bacterial isolates. **National body** refers to the multi-sectoral working group or coordination committee in charge of national AMR strategy. **AMR surveillance programme:** AMR surveillance systems are standardized approaches to the collection, analysis and sharing of data on AMR, in order to inform decision-making, drive local, national and regional action, and provide the evidence base for action and advocacy done.
Disaggregation	Data will be disaggregated by region and country.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Tripartite AMR country self-assessment survey.
DATA COLLECTION	
Method of Measurement	Responses to question 7.6 of the country Tripartite AMR country self-assessment survey. Multi-sectoral working group or coordination committee in charge of national AMR strategy reviews data on antimicrobial consumption and resistance in human and animal sectors at least annually, considers implications for and amends national strategy accordingly. For human health: yes no For animal heath: no yes
Measurement frequency	Annual

REFERENCE SHEET	
Indicator name and number 	**2.i: The Authority and Capability of the Veterinary Services to manage AMU and AMR** Country achieves level III or more on PVS Critical Competency II-9 The authority and capability of the veterinary services to manage AMU and AMR, and to undertake surveillance and control of the development and spread of AMR pathogens in animal production and animal origin food products, via a one health approach.
DESCRIPTION	
Definition/s	Country achieves level III or more on PVS Critical Competency II-9 The authority and capability of the veterinary services to manage AMU and AMR, and to undertake surveillance and control of the development and spread of AMR pathogens in animal production and animal origin food products, via a one health approach.
Disaggregation	OIE Region, Economic status of country
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE PVS Evaluation/follow-up reports/PVS Pathways Database.
Country Level Data Sources, if applicable	Country Records
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Number of countries meeting the definition of the indicator Measurement: OIE PVS tool
Method of estimation	
Measurement frequency	Continuous
References	Terrestrial code references: *Chapter 6.7. on Introduction to the recommendations for controlling antimicrobial resistance* *Chapter 6.8 on Harmonisation of national antimicrobial resistance surveillance and monitoring programmes* *Chapter 6.9.on Monitoring the quantities and usage patterns of antimicrobial agents used in food producing animals* *Chapter 6.10. on Responsible an prudent use of antimicrobial agents in veterinary medicine* *Chapter 6.11. on Risk analysis for antimicrobial resistance arising from the use of antimicrobial agents in animals* Codex to Codex Alimentarius Commission standards: *Guidelines for Risk Analysis of Foodborne Antimicrobial Resistance (CAC/GL 77-2011)* *Code of Practice to Minimize and Contain Antimicrobial Resistance (CAC/RCP 61-2005)*

Outputs for outcome 3: Reduced incidence of infection in health facilities, farms and communities as well as reduced environmental contamination, due to effective prevention

REFERENCE SHEET	
Indicator name and number	**3.a: Regulation for AM waste** Country has a regulatory framework for discharge of antimicrobials, and waste potentially contaminated with antimicrobials, into the environment.
DESCRIPTION	
Definition/s	Waste means any substance or object that the holder discards, intends, or is required to discard.[a]
Disaggregation	Data will be disaggregated by country and region.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	FAOLEX
Country Level Data Sources, if applicable	• National/regional legislation addressing waste, waste management and pollutant activities • Waste Management Plan • National gazettes • National/regional legal databases • Other instruments approved by national institutions with regulatory impact
Secondary data sources, if applicable	Tripartite AMR country self-assessment survey.
DATA COLLECTION	
Method of Measurement	National legislation contained within the FAOLEX database will be reviewed and an assessment will be made regarding the number of countries that comply with each of the following baseline criteria: • Is there national legislation that regulates the disposal of AM? • Is there national legislation that regulates the release into the environment of AM residues from hospitals, pharmaceutical companies, farms, aquaculture sites and other establishments where AM are produced or used? • Are waste management plans, Environmental Impact Assessments, or other regulatory control mechanisms, a requirement to authorize activities that produce, use or otherwise may release AM residues into the environment?[b]
Measurement frequency	FAOLEX database will be reviewed every 3 years. Submission by national authorities of amendments and revisions to national legislation should be undertaken on an continuous basis.

[a] *EU definition (Directive 2008/98/EC DOL312/3)*

[b] These three questions are isolated; in terms of measurement countries may comply with 1, with 2 or with the 3 questions (key indicators)

Limitations (if applicable)	Some countries have fragmented legislation for waste management which will make analysis more challenging. We recognize that proxy indicators do not represent all aspects of a comprehensive framework, but these have been selected as they are considered to be core building blocks that should be in place across countries within 3-5 years. It is not feasible to consider the entirety of each national framework due to resource constraints, but we encourage countries to undertake their own national legislative framework assessment, to identify where any revision may be necessary to achieve effectiveness, as well as to report on the results of such assessment through the tripartite self-assessment questionnaire. Likewise we recognize that FAOlex[c] may not always represent real time changes in national legislation, but encourage countries to update their frameworks in a timely manner upon revision. Finally we note that existence of a legal framework does not necessarily indicate effective enforcement is in place and therefore may not reflect on the ground practices within each country. However, presence of a solid legislative framework is an essential starting point to achieve control of waste containing antimicrobials. We will continue to consider additional data sources to refine this assessment process in future.

[c] http://www.fao.org/faolex/en/

REFERENCE SHEET	
Indicator name and number 	**3.b: Access to strengthened veterinary services** Level of access to veterinary advice and care within country (e.g. number of qualified veterinarians/veterinary para professional to animal population).
DESCRIPTION	
Definition/s	Country achieves level III or more on PVS Critical Competency. III-7: **Veterinary Clinical Services** The availability and quality of veterinary clinical services to meet the needs of all animal owners, including their access to diagnosis and treatment.
Disaggregation	OIE Region, Economic status of the Country
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE PVS Pathway reports.
Country Level Data Sources, if applicable	Country Records
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Number of countries meeting the definition of the indicator Measurement: OIE PVS tool
Method of estimation	
Measurement frequency	Continuous
References	III-7 Terrestrial code Reference Point 6 of Article 3.1.2 on Fundamental principles of quality: Veterinary Legislation. Point 9 of Article 3.2.1 on General considerations. Article 3.2.12 on evaluation of the veterinary statutory body.

REFERENCE SHEET	
Indicator name and number 	**3.c: Food safety standards** Country has adopted food safety standards consistent with the Codex Alimentarius.
Methodology to be developed. Will be published at a later stage.	
DESCRIPTION	
Definition/s	
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	
References	

REFERENCE SHEET	
Indicator name and number 	**3.d: Infection prevention at national Level** Country implements minimum requirements for infection prevention (e.g. husbandry and biosecurity) for food animal production, in accordance with OIE standards.
DESCRIPTION	
Definition/s	Country achieves level III or more on at least two of the following PVS Critical Competencies II-7: **Disease prevention, control and eradication** The authority and capability of the VS to actively perform actions to prevent, control or eradicate OIE listed *diseases* and/or to demonstrate that the country or a zone is free of relevant diseases. II-4 **Quarantine and border security** The authority and capability of the VS to prevent the entry and spread of *diseases* and other hazards of animals and animal products. **CC II–5 Epidemiological surveillance and early detection**: The authority and capability of the VS to determine, verify and report on the sanitary status of the animal populations, including wildlife, under their mandate.
Disaggregation	OIE Region, Economic status of the Country
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	OIE PVS Pathway reports/PVS Pathway database.
Country Level Data Sources, if applicable	Country Records
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Numerator: Number of countries meeting the definition of the indicator PVS Evaluation and Evaluation Follow-Up reports
Method of estimation	
Measurement frequency	Continuous
References	II-7 *Terrestrial Code* References: Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation/ General organisation/Procedures and standards. Points 1–3 of Article 3.2.8. on Animal health controls: Animal health status/Animal health control/ National animal disease reporting systems. Sub-point a) of Point 7 of Article 3.2.14. on Animal health and veterinary public health controls: Animal health. Chapter 4.12. on Disposal of dead animal. II-4 *Terrestrial Code* References: Points 6 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation/ Procedures and standards. Point 2 of Article 3.2.7. on Legislation and functional capabilities: Export/import inspection. Points 6 and 7 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities/ Animal health and veterinary public health controls.

REFERENCE SHEET	
Indicator name and number 	**3.e: Hand hygiene in health care** Percentage of acute tertiary health care facilities monitoring hand hygiene compliance of health workers according to the WHO direct observation method or similar
DESCRIPTION	
Definition/s	
Disaggregation	Public vs private
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	Health facility assessments and other sources, e.g. national/state/ district IPC programmes coordinating implementation of the IPC Core Components and associated baseline and follow-up assessments (e.g. The facility-level IPC Assessment Framework (IPCAF). NOTE: Data collected globally on "Basic hand hygiene services" linked to SDG 6 by the WHO/ UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), based on core indicators and questions developed by the Global Task Team for Monitoring WASH in HCF, can be used to supplement the information for this indicator. https://www.who.int/water_sanitation_health/publications/core-questions-and-indicators-for-monitoring-wash/en/
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Surveys using WHO observation form, the WHO hand hygiene self-assessment framework (HHSAF), and the WHO infection prevention and control assessment framework (IPCAF).
Method of estimation	Requires reliable monitoring and reporting of health worker behavior by trained hand hygiene auditors in a facility. Numerator: Number of health care facilities regularly (at least annually) monitoring hand hygiene compliance Denominator: Total number of health care facilities
Measurement frequency	Annually or biannually
References	World Health Organization. IPC. Tools for hand hygiene evaluation and feedback (website): http://www.who.int/infection-prevention/tools/hand-hygiene/evaluation_feedback/en/ World Health Organization. Core components for IPC. Implementation tools and resources (website): http://www.who.int/infection-prevention/tools/core-components/en/ WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP): https://washdata.org/monitoring/hygiene

REFERENCE SHEET	
Indicator name and number 	**3.f: Basic water services in health care facilities** Percentage of health care facilities where the main source of water is improved source, located on premises, from which water is available
DESCRIPTION	
Definition/s	Proportion of health care facilities where the main source of water is an improved source, located on premises, from which water is available. Improved water sources are those which, by nature of their design and construction, have the potential to deliver safe water. Improved sources include: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water. Unimproved sources include unprotected dug wells or springs and surface water (e.g. lake, river, stream, pond, canals, irrigation ditches). On premises is water accessed within buildings, or within the facility grounds. Water is considered available if water from the main source is available on the day of the survey or questionnaire.
Disaggregation	Place (urban/rural) Type (hospital/non-hospital) Management (government/non-government)
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	Health facility assessment surveys, programme surveys, health facility censuses, regulatory data.
Country Level Data Sources, if applicable	Data will be reported for each country (where data exists), region, and globally.
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Question asked by enumerators at facility; where possible enumerators will visually confirm type of water facility and availability of water.
Method of estimation	A detailed methodological note is being prepared and will be published by WHO/UNICEF in 2019 with the first baseline report on WASH in health care facilities. Numerator: Facilities with basic water services Denominator: Total number of health care facilities in a country
Measurement frequency	The WHO/UNICEF Joint Monitoring Programme as custodial agencies for measurement of WASH in health care facilities will report on figures every two years. The first report on WASH in health care facilities will be published in March 2019. National and regional data will be available on the JMP website: https://washdata.org/.
References	Core questions and indicators for monitoring water, sanitation and hygiene in the Sustainable Development Goals. WHO/UNICEF, 2018. https://www.who.int/water_sanitation_health/publications/monitoring-wash-in-health-care-facilities-aug-2018.pdf?ua=1

REFERENCE SHEET	
Indicator name and number 	**3.g: Basic sanitation services in health care facilities** Proportion of health care facilities with improved and usable sanitation facilities, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for users with limited mobility.
DESCRIPTION	
Definition/s	Definition: Proportion of health care facilities with improved and usable sanitation facilities, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for users with limited mobility. Improved sanitation facilities are those designed to hygienically separate excreta from human contact. Improved sanitation facilities are those designed to hygienically separate excreta from human contact. Improved facilities include: flush/pour flush to piped sewer system, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs. Unimproved facilities include pit latrines without a slab or platform, hanging latrines, and bucket latrines. For the purpose of this document "toilets" is taken to mean any of these improved facilities. Usable: To be considered usable, a toilet should be available, functional and private at the time of the survey or questionnaire. Available to patients and staff: toilets are on premises, doors are unlocked or a key is available at all times. Functional (the toilet is not broken, the toilet hole is not blocked, there should be no cracks or leaks in the toilet structure and water is available for flush/pour-flush toilets). Private (there are closable doors that can be locked from the inside and no large gaps or holes in the structure) on the day of the survey or questionnaire. Dedicated for staff: there are separate toilet facilities dedicated for patient and staff use. Sex-separated with menstrual hygiene facilities: at least one toilet is separated for use by women/girls, and has a bin with a lid on it and/or water and soap available in a private space for washing. Toilets are considered accessible to individuals with limited mobility if they meet relevant national or local standards. In the absence of such standards, toilets should be accessible without stairs or steps, have handrails for support attached either to the floor or sidewalls, a door which is at least 80 cm wide, and the door handle and seat within reach of people using wheelchairs or crutches/sticks.
Disaggregation	Place (urban/rural) Type (hospital/non-hospital) Management (government/non-government)
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	Health facility assessment surveys, programme surveys, health facility censuses, regulatory data.
Country Level Data Sources, if applicable	Data will be reported for each country (where data exists), region, and globally.
Secondary data sources, if applicable	

DATA COLLECTION	
Method of Measurement	Question asked by enumerators at facility; where possible enumerators will visually confirm type of toilet, usability and other indicators in the definition of "basic" sanitation services.
Method of estimation	A detailed methodological note is being prepared and will be published by WHO/UNICEF in 2019 with the first baseline report on WASH in health care facilities. Numerator: Facilities with basic sanitation services Denominator: Total number of health care facilities in a country
Measurement frequency	The WHO/UNICEF Joint Monitoring Programme as custodial agencies for measurement of WASH in health care facilities will report on figures every two years. The first report on WASH in health care facilities will be published in March 2019. National and regional data will be available on the JMP website: https://washdata.org/
References	Core questions and indicators for monitoring water, sanitation and hygiene in the Sustainable Development Goals. WHO/UNICEF, 2018. https://www.who.int/water_sanitation_health/publications/monitoring-wash-in-health-care-facilities-aug-2018.pdf?ua=1

Outputs for outcome 4: Optimized use of antimicrobials in human and animal health, with growth promotion phased out for animal use

REFERENCE SHEET	
Indicator name and number 	**4.a: Regulatory framework for veterinary medicinal products** Country has a regulatory framework for veterinary medicinal products (VMPs) (including medicated feed) that covers all stages of the life cycle (manufacture, supply, sale, use, disposal), and meets other requirements in the OIE and Codex standards.
DESCRIPTION	
Definition/s	Veterinary medicinal product: means any product with approved claims to having a prophylactic, therapeutic or diagnostic effect or to alter physiological functions when administered or applied to an animal (OIE glossary terrestrial code). Medicated feed refers to feed that contains a veterinary medicinal product. Life cycle means all the stages a VMP might pass through from production to its degradation in the environment after use, or its destruction as an unused product. The life cycle includes manufacture, formulation, packaging, distribution, storage, transport, use and final disposal of a product and/or its container.[a]
Disaggregation	Data will be disaggregated at country and regional level.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	FAOLEX
Country Level Data Sources, if applicable	National legislation National gazettes National legal databases World Bank Enabling the Business of Agriculture yearly reports and database of national legislation (due in 2019)
Secondary data sources, if applicable	Tripartite AMR country self-assessment survey
DATA COLLECTION	
Method of Measurement	National legislation contained within the FAOLEX database will be reviewed and an assessment will be made regarding the number of countries that comply with Stage 1, 2 or 3 of the following baseline criteria: **Stage 1** Does the country have legislation for the authorization of VMPs, including medicated feed[b] (VMP legislation)?

[a] www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev04/English/ST-SG-AC10-30-Rev4e

[b] Medicated feed could be regulated under the same VMP legislation or under separate legislation (such as feed legislation)

	Stage 2: 1: Does the country meet Stage 1? and 2: does VMP legislation include that no VMP that requires prescription according to national legislation, will be supplied unless accompanied with a prescription from a qualified veterinarian or authorized veterinary paraprofessional? **Stage 3:** 1: Does the country meet stages 1 and 2? and 3: Does VMP legislation include all stages of the VMP life cycle (manufacture, use, distribution, disposal and waste management)
Measurement frequency	FAOLEX database will be reviewed every 3 years. Submission by national authorities of amendments and revisions to national legislation should be undertaken on an continuous basis.
Limitations (if applicable)	We recognize that proxy indicators do not represent all aspects of a comprehensive framework, but these have been selected as they are considered to be core building blocks that should be in place across countries within 3–5 years. It is not feasible to consider the entirety of each national framework due to resource constraints, but we encourage countries to undertake their own national legislative framework assessment, to identify where any revision may be necessary to achieve effectiveness, as well as to report on the results of such assessment through the tripartite self-assessment questionnaire. Likewise we recognize that FAOlex[c] may not always represent real time changes in national legislation, but encourage countries to update their frameworks in a timely manner upon revision. Finally we note that existence of a legal framework does not necessarily indicate effective enforcement is in place and therefore may not reflect on the ground practices within each country. However, presence of a solid legislative framework is an essential starting point to achieve control of VMP lifecycle. We will continue to consider additional data sources to refine this assessment process in future.

[c] http://www.fao.org/faolex/en/

REFERENCE SHEET	
Indicator name and number 	**4.b: Regulatory framework for non-medicinal AMs** Country has a regulatory framework for pesticides AMs that takes into consideration all stages of the antimicrobial life cycle (production, supply, sale, use, disposal), and meets other requirements in the reference international standards.
DESCRIPTION	
Definition/s	Pesticide means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth (International Code of Conduct on Pesticide Management (ICCPM)).[a] Life cycle means all the stages a pesticide might pass through from production to its degradation in the environment after use, or its destruction as an unused product. The life cycle includes manufacture, formulation, packaging, distribution, storage, transport, use and final disposal of a pesticide product and/or its container (ICCPM).[b] Pesticides applied to plants include bactericides and fungicides, which may impact development of resistance in bacteria on plants or in the surrounding environment. Note that the terminology commonly used for chemicals or products in plant health varies from that applied in animal and human health, as reflected in the wording of this indicator.
Disaggregation	Data will be disaggregated at country and regional level.
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	FAOLEX
Country Level Data Sources, if applicable	National legislation National gazettes National legal databases
Secondary data sources, if applicable	Tripartite AMR country self-assessment survey (TrACSS)
DATA COLLECTION	
Method of Measurement	National legislation contained within the FAOLEX database will be reviewed and an assessment will be made regarding the number of countries that comply with Stage 1 or 2 of the following baseline criteria: **Stage 1** Does national legislation include a mechanism to register/authorize pesticides that would enable taking into consideration AMR-related criteria? **Stage 2** Is there national legislation on pesticide management that takes into consideration all stages of the life cycle (including registration)?
Measurement frequency	FAOLEX database will be reviewed every 3 years. Submission by national authorities of amendments and revisions to national legislation should be undertaken on an continuous basis.

[a] www.fao.org/fileadmin/templates/.../Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf
[b] www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev04/English/ST-SG-AC10-30-Rev4e

Limitations (if applicable)	We recognize that proxy indicators do not represent all aspects of a comprehensive framework, but these have been selected as they are considered to be core building blocks that should be in place across countries within 3–5 years. It is not feasible to consider the entirety of each national framework due to resource constraints, but we encourage countries to undertake their own national legislative framework assessment, to identify where any revision may be necessary to achieve effectiveness, as well as to report on the results of such assessment through the tripartite self-assessment questionnaire. Likewise we recognize that FAOlex[c] may not always represent real time changes in national legislation, but encourage countries to update their frameworks in a timely manner upon revision. Finally we note that existence of a legal framework does not necessarily indicate effective enforcement is in place and therefore may not reflect on the ground practices within each country. However, presence of a solid legislative framework is an essential starting point to achieve control of pesticide lifecycle. We will continue to consider additional data sources to refine this assessment process in future.

[c] http://www.fao.org/faolex/en/

REFERENCE SHEET	
Indicator name and number 	**4.c: Optimized use** Country has laws or regulation that prohibits use of antibiotics for growth promotion in the absence of risk analysis.
DESCRIPTION	
Definition/s	**Growth promotion** refers to the use of antimicrobial substances to increase the rate of weight gain and/or the efficiency of feed utilization in animals by other than purely nutritional means. The term does NOT apply to the use of antimicrobial agents for the specific purpose of treating, controlling, or preventing infectious diseases, even when an incidental growth response may be obtained (CAC/RCP 61-2005)[a]
Disaggregation	
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	Tripartite AMR country self-assessment survey – question 5.4.
Country Level Data Sources, if applicable	National legislation National legal databases National gazettes
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Number of countries responding positively to relevant sections question 5.4 of the country self-assessment questionnaire
Method of estimation	
Measurement frequency	Annual
References	Aquatic code – http://www.oie.int/en/standard-setting/aquatic-code/access-online/ Terrestrial code – http://www.oie.int/en/standard-setting/terrestrial-code/access-online/

[a] www.fao.org/input/download/standards/10213/CXP_061e.pdf

Outputs for outcome 5: Increased R&D on new medicines, diagnostics, vaccines and other interventions related to priority infections

REFERENCE SHEET	
Indicator name and number 	**5.a: Mechanisms and Investments for R&D: List of mechanisms and funding for R&D to prevent, diagnose and treat priority pathogens (new medicines, diagnostics, vaccines, etc.).**
DESCRIPTION	
Definition/s	a: Total amount of funding for R&D for priority pathogens b: Number of (existing and) new partnerships for AMR R&D targeting priority pathogens
Disaggregation	1: Funding 2: Partnerships
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/OIE)	Global AMR R&D Hub
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	
Method of estimation	
Measurement frequency	Annually
References	http://www.who.int/research-observatory/monitoring/inputs/neglected_diseases/en/ Global Antibiotic Research & Development Partnership (GARDP): https://www.gardp.org/

Information for this indicator will be collected and managed globally by WHO

REFERENCE SHEET	
Indicator name and number 	**5.b: Mechanisms and Investments for R&D: List of mechanisms, commitments and expenditures for R&D targeting priority pathogens (new medicines, diagnostics, vaccines, etc.).**
DESCRIPTION	
Definition/s	a: Total amount of commitments and expenditures on R&D targeting priority pathogens b: Number of existing and new partnerships for AMR R&D targeting priority pathogens
Disaggregation	a: Medicines b: Diagnostics c: Vaccines: disease; vaccine type
DATA COLLECTION SOURCES	
Data Sources (data collected by FAO/WHO/ OIE)	WHO Observatory on Health R&D STAR-IDAZ International Consortium on Animal Health
Country Level Data Sources, if applicable	
Secondary data sources, if applicable	
DATA COLLECTION	
Method of Measurement	Global AMR R&D Hub database
Method of estimation	
Measurement frequency	Annually
References	http://www.who.int/research-observatory/monitoring/inputs/neglected_diseases/en/ Global Antibiotic Research & Development Partnership (GARDP): https://www.gardp.org/

The information for this indicator will be collected managed at the global level only by WHO

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