
Antimicrobial Resistance and Stewardship:
A Training Program for Nurses and Midwives
स्वागत छ
Welcome
August 29, 2021

ANTIMICROBIAL RESISTANCE STEWARDSHIP & INFECTION PREVENTION AND CONTROL:

A TRAINING PROGRAM FOR NURSES AND MIDWIVES

PROGRAM OVERVIEW

PROGRAM OBJECTIVES

- TO INCREASE AWARENESS OF ANTIMICROBIAL RESISTANCE (AMR) BOTH FORM THE PERSPECTIVE OF HOSPITAL CARE AND COMMUNITY CARE;
- TO INCREASE AWARENESS OF AMR STEWARDSHIP FOR NURSES AND MIDWIVES TO DECREASE RISKS ASSOCIATED WITH AMR;
- TO INCREASE AWARENESS OF HOSPITAL-BASED AND COMMUNITY-BASED INFECTION PREVENTION AND CONTROL MEASURES TO REDUCE RISKS TO HEALTHCARE PROVIDERS, PATIENTS, AND THE COMMUNITIES;
- TO SUPPORT COMMUNICATION ABOUT AMR AND IPC WITHIN HEALTHCARE SETTINGS BETWEEN PEERS AND WITH PATIENTS.
- TO SUPPORT COMMUNICATION ABOUT AMR AND IPC WITHIN COMMUNITIES.

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 1: STEWARDSHIP AND NURSING AND MIDWIFERY PRACTICE

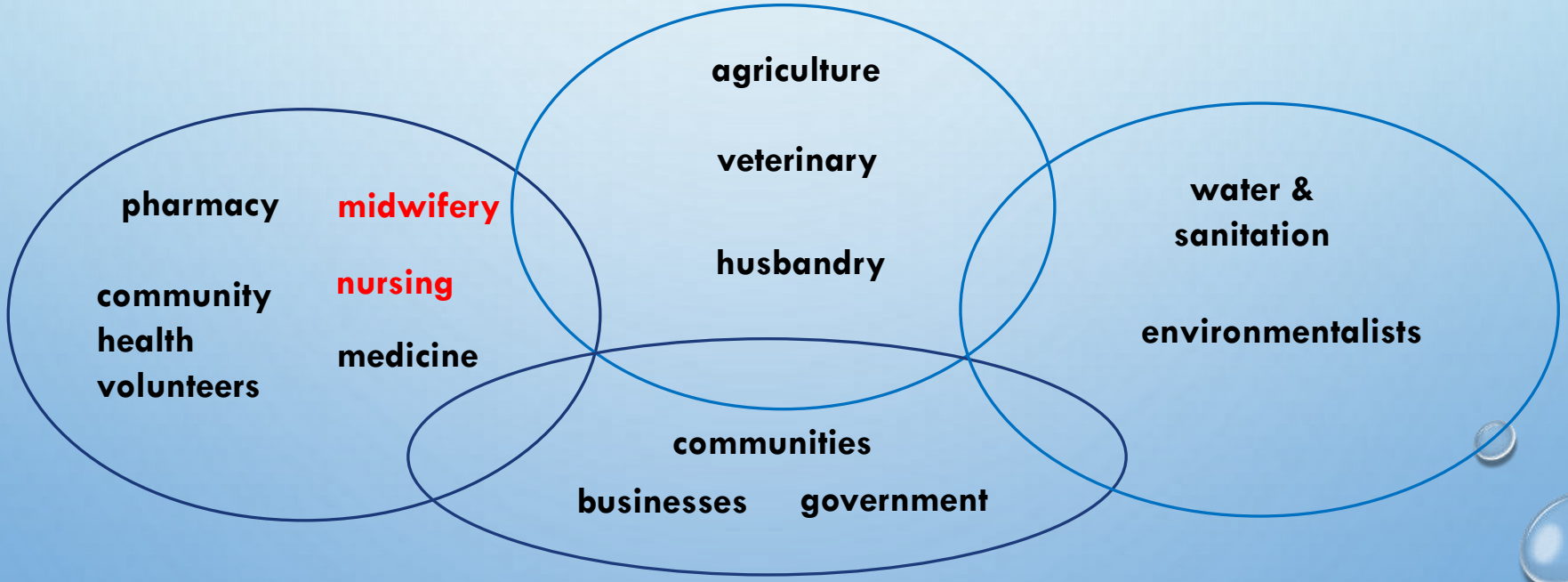
AMS: NURSES AND MIDWIVES

- MANY COMMUNITIES HAVE LITTLE OR NO ACCESS TO PHYSICIANS AND/OR HOSPITALS AND THEREFORE COMMUNITY HEALTH FACILITIES PROVIDE ESSENTIAL HEALTH CARE.
  - NEPAL WAS FOUND TO HAVE **0.17 DOCTORS PER 1,000/POPULATION AND 0.50 NURSES PER 1,000/POPULATION.** THIS IS SIGNIFICANTLY LESS THAN THE **WHO RECOMMENDATION OF 2.3 DOCTORS, NURSES AND MIDWIVES PER 1,000/POPULATION**.
  - **THESE PROPORTIONS VARY ACROSS AREAS OF NEPAL,** E.G., THE TERAI ZONE HAD ONLY 36% OF HEALTH WORKERS WHEN IT ACCOUNTED FOR 50% OF THE COUNTRY'S POPULATION IN 2011. SIXTY-SIX PERCENT OF ALL DOCTORS AND 58% OF ALL NURSES WERE LOCATED IN THE HILLS ZONE INCLUDING KATHMANDU VALLEY.

http://www.nhssp.org.np/NHSSP_Archives/human_resources/HRH_Nepal_profile_august2013.pdf

AMS NURSES AND MIDWIVES

ANTIMICROBIAL STEWARDSHIP IS A RESPONSIBILITY ACROSS SECTORS AND COMMUNITIES



AMS: NURSES AND MIDWIVES

- NURSES AND MIDWIVES ARE:
  - A LARGE SEGMENT OF HEALTH PROFESSIONALS BOTH IN HOSPITALS AND COMMUNITIES;
  - AT THE CENTER OF PATIENT CARE AND PATIENT HEALTH EDUCATION
  - ESSENTIAL TO ESTABLISHING MULTIDISCIPLINARY HEALTH TEAMS IN BOTH HOSPITALS AND COMMUNITIES
  - COMMUNITY-BASED NURSES AND MIDWIVES MAY BE THE ONLY SOURCE OF HEALTHCARE IN MANY REMOTE AREAS OF NEPAL
  - COMMUNITY-BASED NURSES AND MIDWIVES MAY BE RESPONSIBLE FOR PRESCRIBING ANTIBIOTICS

http://www.nhssp.org.np/NHSSP_Archives/human_resources/HRH_Nepal_profile_august2013.pdf

AMS: NURSES AND MIDWIVES

- THE ROLES OF NURSES AND MIDWIVES IN STEWARDSHIP AND INFECTION PREVENTION AND CONTROL
  - PROVIDING HOSPITAL AND PRIMARY HEALTH CARE
  - SPECIMEN COLLECTION: APPROPRIATE TECHNIQUE
  - EARLY DETECTION OF SIGNS AND SYMPTOMS
  - SUPPORTING IMMUNIZATION PROGRAMS
  - HAND HYGIENE
  - ENVIRONMENTAL HYGIENE

DISCUSSION QUESTIONS

- WHAT DO YOU SEE AS YOUR ROLES IN TERMS OF AMR STEWARDSHIP AND IPC IN YOUR WORKPLACE?
- WHAT DO YOU NEED TO SUPPORT STEWARDSHIP AND IPC IN YOUR WORKPLACE?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 2: INTRODUCTION TO AMR AND STEWARDSHIP

MODULE 2 OBJECTIVES

- DEFINING ANTIMICROBIAL RESISTANCE (AMR)
- INCREASE UNDERSTANDING OF HOW BACTERIA BECOME RESISTANT
- INCREASE UNDERSTANDING OF RISKS ASSOCIATED WITH AMR
- INCREASE KNOWLEDGE ABOUT WHICH PATHOGENS POSE THE GREATEST THREATS
- INCREASE UNDERSTANDING OF HOW AMR CAN BE ADDRESSED

WHAT IS ANTIMICROBIAL RESISTANCE?

- "A POST-ANTIBIOTIC ERA MEANS … AN END TO MODERN MEDICINE AS WE KNOW IT. THINGS AS COMMON AS STREP THROAT OR A CHILD'S SCRATCHED KNEE COULD ONCE AGAIN KILL."

MARGARET CHAN, WORLD HEALTH ORGANIZATION DIRECTOR-GENERAL

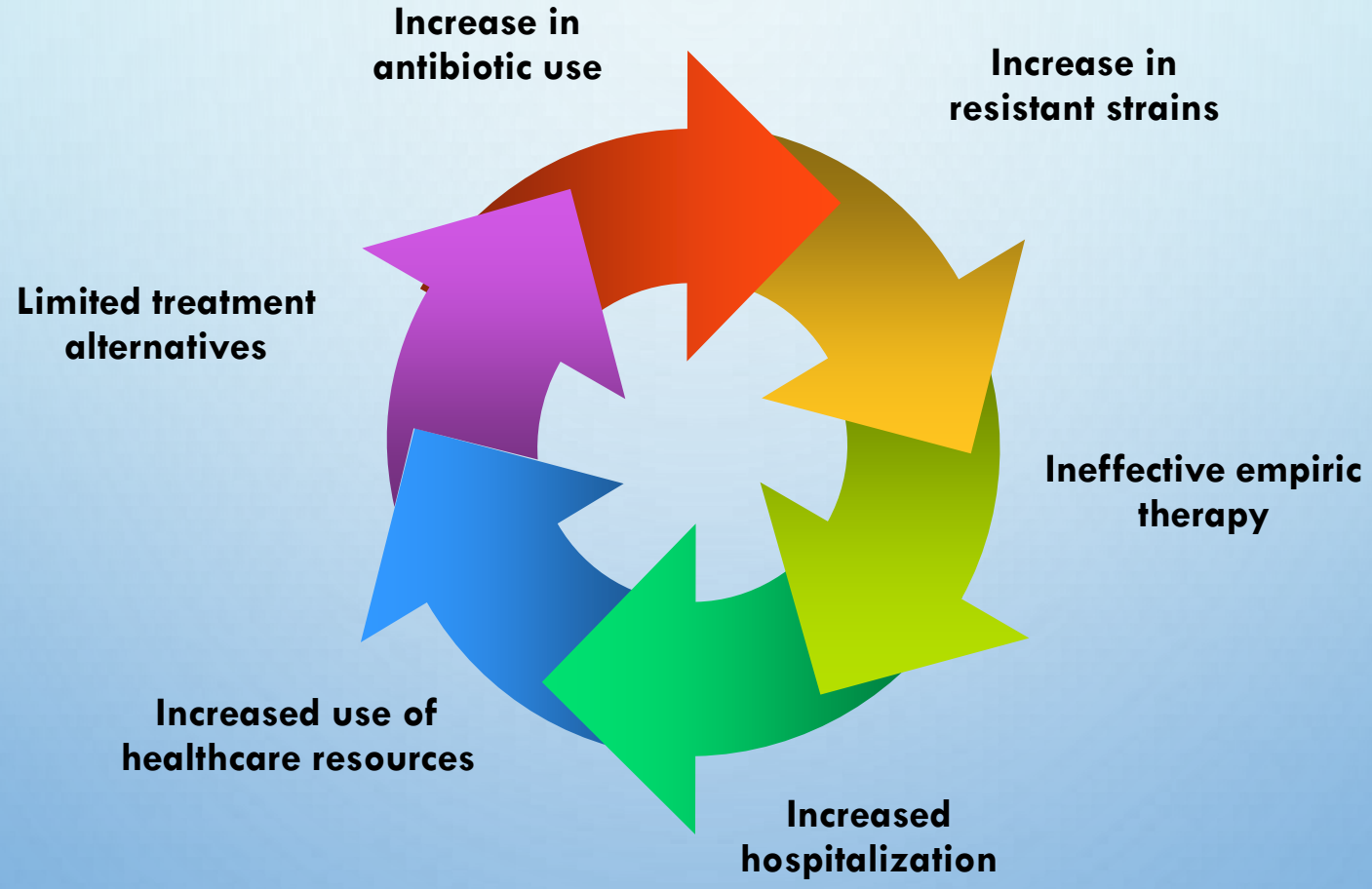
WHAT IS AMR

Antimicrobial resistance (AMR) is the ability of a microorganism (**bacteria**, viruses, and some parasites) to stop an antimicrobial (**antibiotics**, antivirals and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others.[1]

Today, an estimated 700,000 deaths attributable to AMR every year. In 30 years, this number could reach 10,000,000 deaths.[2]

[1,2] https://www.who.int

ANTIBIOTIC CYCLE OF RESISTANCE



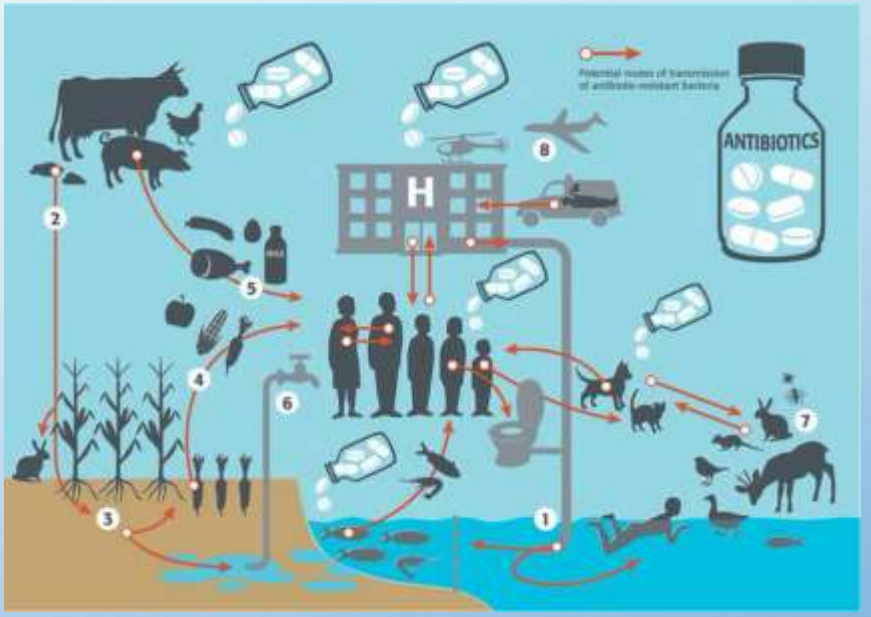
HOW DO BACTERIA BECOME RESISTANT?

- ANTIBIOTIC RESISTANCE OCCURS NATURALLY OVER TIME, USUALLY THROUGH GENETIC CHANGES. HOWEVER, THE MISUSE AND OVERUSE OF ANTIBIOTICS IS ACCELERATING THIS PROCESS.
- ANTIBIOTICS ARE MISUSED IN PEOPLE AND ANIMALS.
  - ANTIBIOTICS USED TO TREAT VIRAL INFECTIONS LIKE COLDS AND FLU
  - ANTIBIOTICS GIVEN AS GROWTH PROMOTERS IN ANIMALS.
- ANTIBIOTIC RESISTANT-MICROBES ARE FOUND IN PEOPLE, ANIMALS, FOOD, AND THE ENVIRONMENT (IN WATER, SOIL AND AIR). THEY CAN SPREAD BETWEEN PEOPLE AND ANIMALS, INCLUDING FROM FOOD OF ANIMAL ORIGIN, AND FROM PERSON TO PERSON. POOR INFECTION CONTROL, INADEQUATE SANITARY CONDITIONS AND INAPPROPRIATE FOOD-HANDLING ENCOURAGE THE SPREAD OF ANTIMICROBIAL RESISTANCE.

[1] HTTPS://WWW.WHO.INT/ANTIMICROBIAL-RESISTANCE/EN/

TRANSMISSION OF AMR BACTERIA

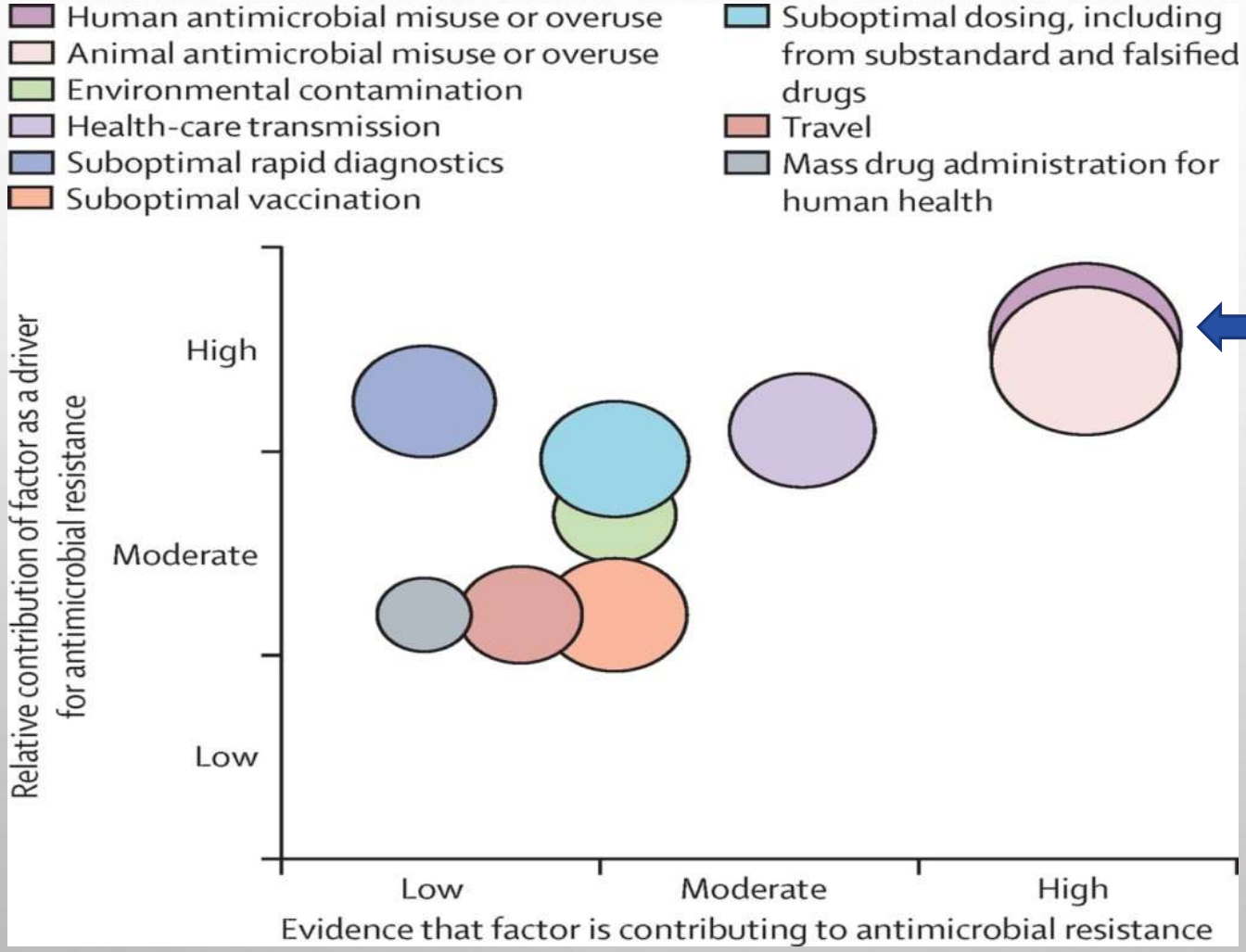
- 1. POLLUTION FROM PHARMACEUTICAL PRODUCTION. HOSPITALS AND OTHER HEALTH FACILITIES;
- 2/3. USE OF ORGANIC ANIMAL WASTE/MANURES IN AGRICULTURE;
- 4/5. CONSUMPTION OF FOODS EXPOSED TO WASTE/ANIMAL MANURE;
- 6. PROXIMITY OF WATER SUPPLIES TO SEPTIC/SANITATION SYSTEMS;
- 7. MISUSE OF ANTIBIOTICS IN VETERINARY MEDICINE. HUMAN CONSUMPTION OF ANTIBIOTICS
- 8. TRAVEL BETWEEN COUNTRIES/REGIONS.



WHAT IS A ONE HEALTH APPROACH?

- 'ONE HEALTH' IS AN APPROACH TO DESIGNING AND IMPLEMENTING PROGRAMS, POLICIES, LEGISLATION AND RESEARCH IN WHICH MULTIPLE SECTORS COMMUNICATE AND WORK TOGETHER TO ACHIEVE BETTER PUBLIC HEALTH OUTCOMES.
- A ONE HEALTH APPROACH IS PARTICULARLY RELEVANT FOR COMBATTING ANTIBIOTIC RESISTANCE AND SUPPORTING STEWARDSHIP.

HTTPS://WWW.WHO.INT/FEATURES/QA/ONE-HEALTH/EN/



The greatest contributions to AMR are misuse and overuse of antimicrobials in humans and animals

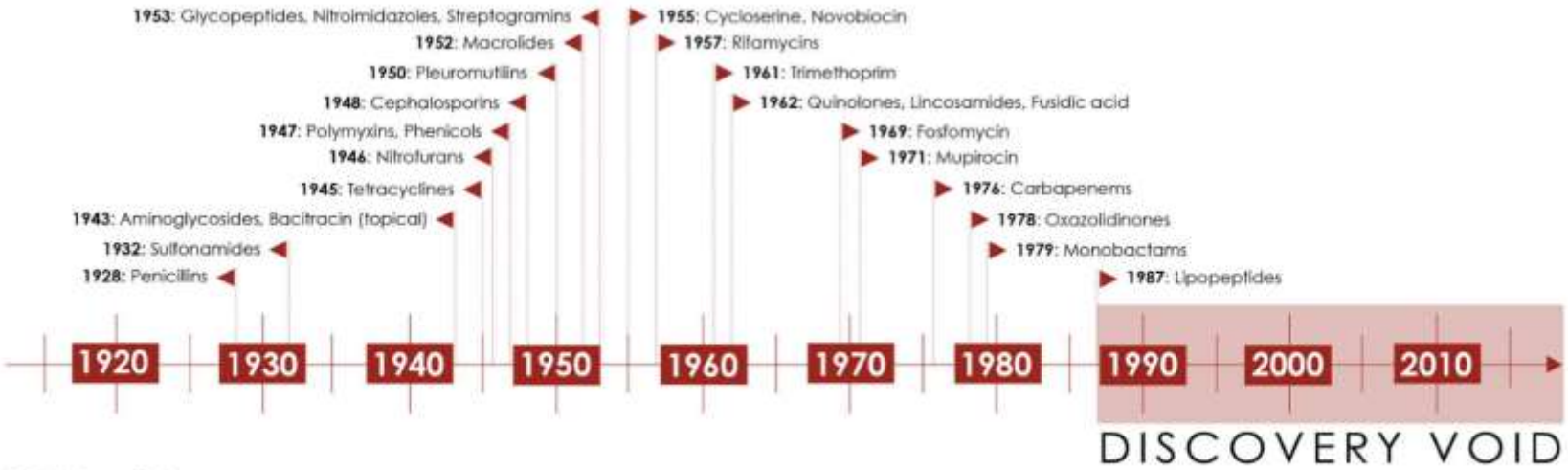
WHY IS AMR A RISK?

- **ORGANISMS WHICH PRESENT THE GREATEST THREAT (WORLD HEALTH ORGANIZATION)**
  - MULTIDRUG-RESISTANT *ACINETOBACTER*
  - EXTENDED SPECTRUM B-LACTAMASE PRODUCING ENTEROBACTERIACEAE (ESBLS)
  - DRUG-RESISTANT *SALMONELLA* TYPHI
  - METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA)
  - DRUG-RESISTANT *STREPTOCOCCUS PNEUMONIAE*
  - VANCOMYCIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (VRSA)
  - CARBAPENEM-RESISTANT ENTEROBACTERIACEAE (CRE)
  - VANCOMYCIN-RESISTANT *ENTEROCOCCUS* (VRE)

WHY IS AMR A RISK?

Antibiotic Pipeline Dry

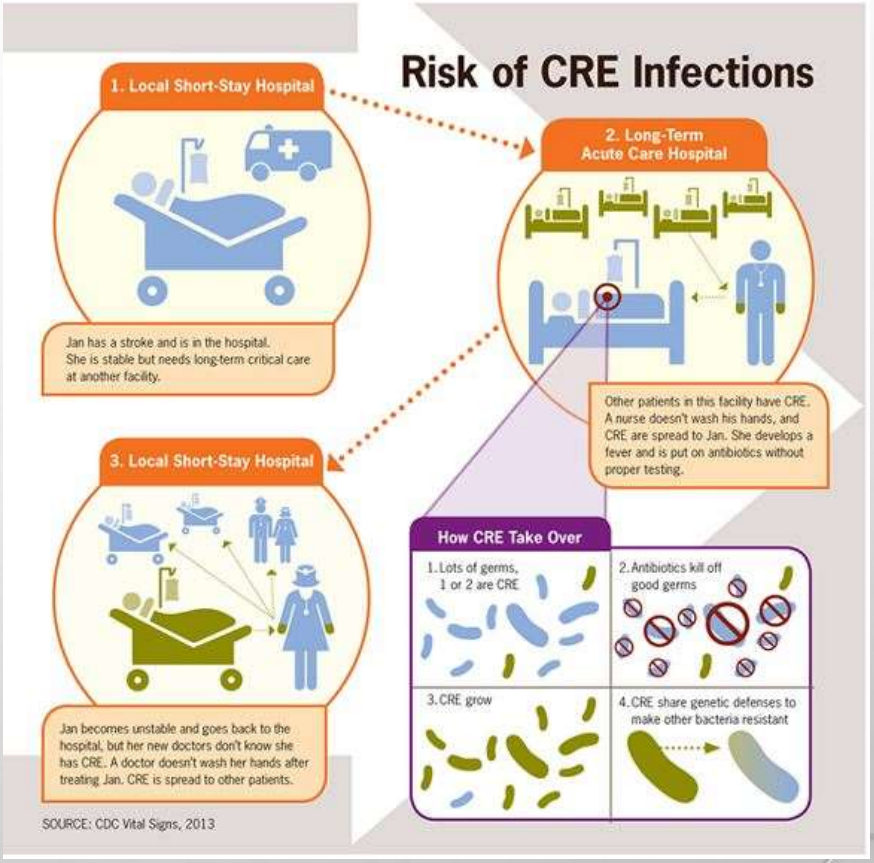
Decrease in number of new antibiotics



CASE STUDY: CRE INFECTIONS

Carbapenem-resistant Enterobacteriaceae (CRE) are strains of bacteria that are resistant to an antibiotic class (carbapenem) used to treat severe infections. CRE are also resistant to most other commonly used antibiotics and in some cases to all available antibiotics. CRE pathogens can spread and share their antibiotic-resistant qualities with healthy bacteria in your body.

https://www.mayoclinic.org/diseases-conditions/infectious-diseases/in-depth/cre-bacteria/art-20166387#:~:text=Carbapenem%2Dresistant%20Enterobacteriaceae%20(CRE),cases%20to%20all%20available%20antibiotics.



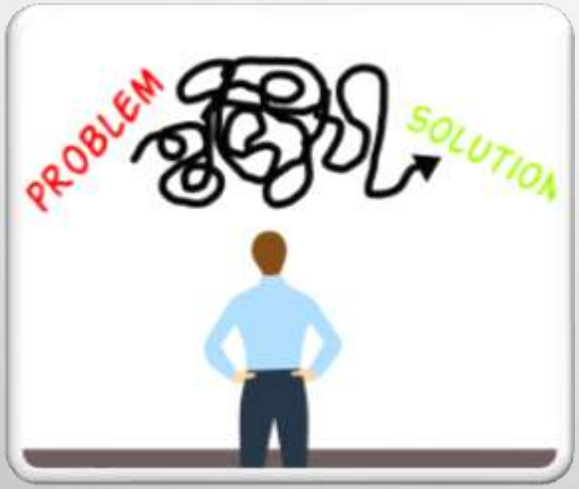
CASE STUDY: TYPHOID FEVER (*S. TYPHI*)

Coalition Against Typhoid Available at: https://www.coalitionagainsttyphoid.org/wp-content/uploads/2019/06/epal_InfograNphic_English.pdf

https://aac.asm.org/content/64/5/e02581-19

- 12 TO 21 MILLION CASES OF TYPHOID FEVER ANNUALLY. 75% IN SOUTH ASIA. NEPAL HAS ONE OF THE HIGHEST LEVELS OF BURDEN FOR TYPHOID FEVER.
  - **IN NEPAL, AN ESTIMATED 351/100,000 PEOPLE CONTRACTED TYPHOID FEVER IN 2017**
- FIRST LINE TREATMENT INCLUDED AMPICILLIN, TRIMETHOPRIM-SULFAMETHOXAZOLE, CHLORAMPHENICOL. RESISTANCE TO THESE FIRST LINE ANTIBIOTICS WERE OBSERVED IN THE 1980'S.
- FLUOROQUINOLONES BECAME A PRIMARY SOURCE OF TREATMENT UNTIL 2014 DATA INDICATED HIGH RATES OF TREATMENT FAILURE OCCURRING DUE TO RESISTANCE TO FLUOROQUINOLONES.
- INCREASED RESISTANCE TO FLUOROQUINOLONES LED TO USE OF 3RD GENERATION CEPHALOSPORINS
- 2016 IDENTIFICATION OF XDR (EXTENSIVELY DRUG RESISTANT) *S.* TYPHI IN PAKISTAN
  - TREATMENT RESTRICTED TO AZITHROMYCIN AND CARBAPENEMS

HOW CAN AMR BE ADDRESSED?



- BUILD LABORATORY CAPACITY
- IMPROVE SURVEILLANCE
- NEW TESTS AND DIAGNOSTICS
- NEW DRUGS
- **ANTIMICROBIAL STEWARDSHIP; BOTH INPATIENT AND OUTPATIENT, FORMAL AND INFORMAL SECTORS**
- REDUCE USE OF ANTIBIOTICS IN FOOD ANIMALS, ELIMINATION OF GROWTH PROMOTING ANTIBIOTICS
- **BETTER INFECTION PREVENTION & CONTROL**
- **IMPROVE PREVENTION STRATEGIES; E.G., IMMUNIZATION**
- INNOVATION: ALTERNATIVES TO ANTIBIOTICS

HOW CAN AMR BE ADDRESSED?

Antimicrobial stewardship programs optimize the use of antimicrobials, improve patient outcomes, reduce AMR and health-care-associated infections, and save health-care costs.

Optimizing antibiotic use includes:

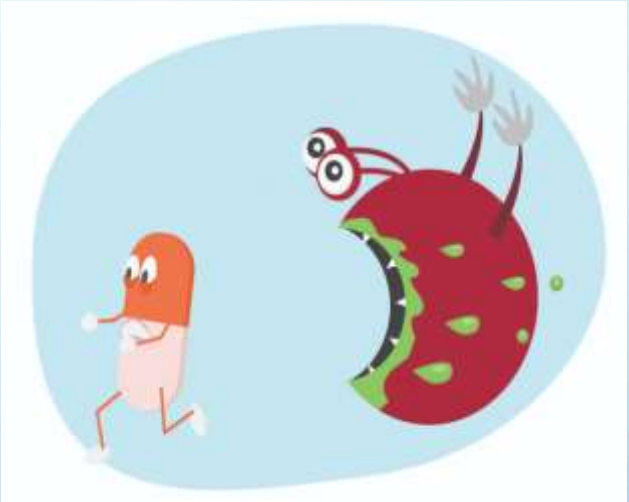
- only **use when needed**
- use the **right agent** (antibiotic)
- at the **right dose**
- for the **right duration**

DISCUSSION QUESTIONS

- WHAT ARE THE PRIMARY CAUSES OF ANTIMICROBIAL RESISTANCE?
- HOW DOES ANTIMICROBIAL RESISTANCE AFFECT THE COMMUNITIES WHERE YOU LIVE AND WORK?
- WHAT IS THE ROLE OF STEWARDSHIP IN ADDRESSING ANTIMICROBIAL RESISTANCE?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 3: AMR IN NEPAL



ANTIMICROBIAL RESISTANCE IN NEPAL

DR. BASUDHA SHRESTHA

SENIOR CONSULTANT MICROBIOLOGIST

PHECT-NEPAL/KATHMANDU MODEL HOSPITAL

ANTIMICROBIAL RESISTANCE & STEWARDSHIP: AMR IN NEPAL

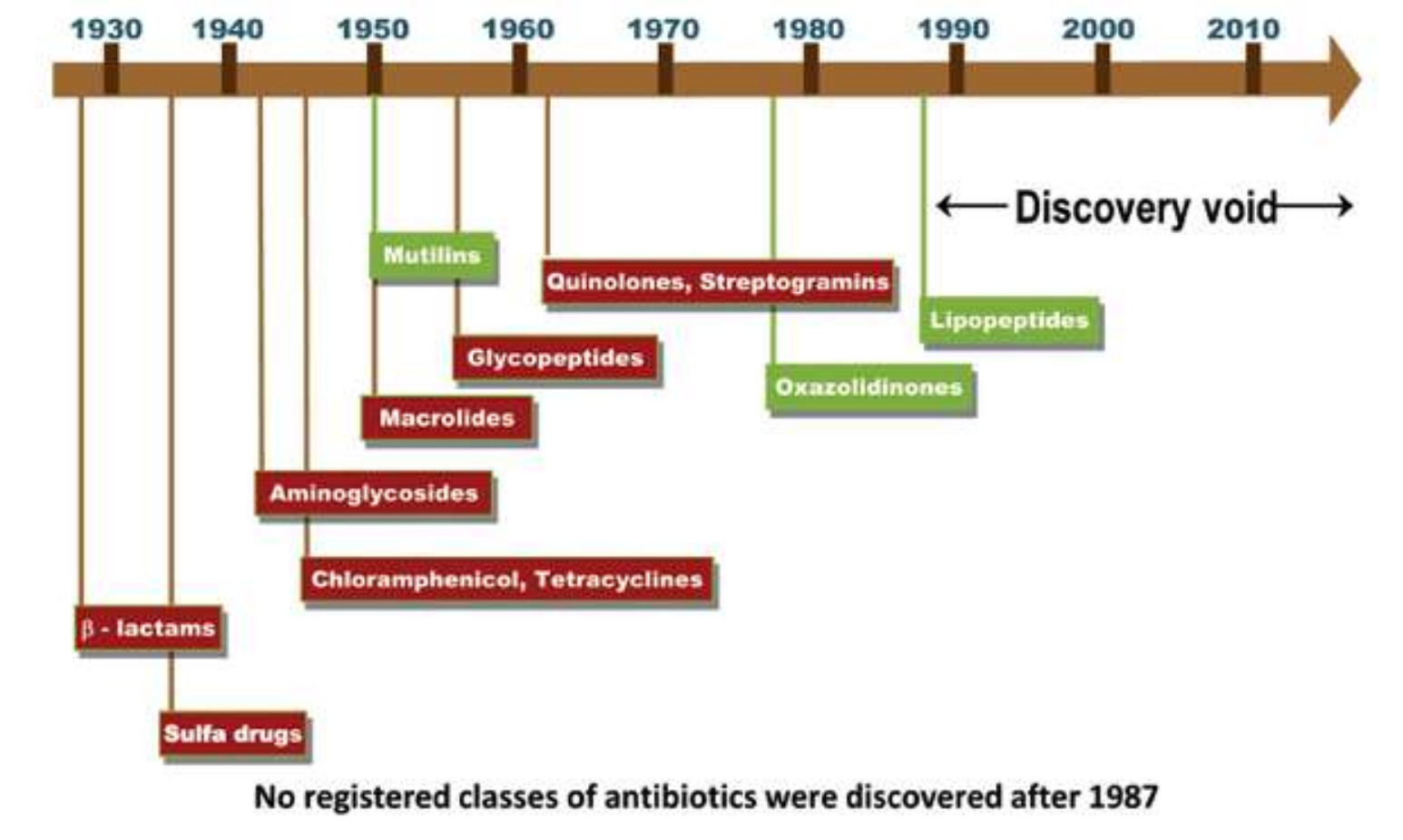
ANTIMICROBIAL RESISTANCE PATTERNS VARY ACROSS COUNTRIES AND ACROSS REGIONS WITHIN COUNTRIES. NATIONAL AND LOCAL DATA ARE IMPORTANT TO UNDERSTANDING AMR AND WHICH ANTIBIOTICS ARE LIKELY TO BE MORE OR LESS EFFECTIVE.

LOCAL COMMUNITIES OFTEN DO NOT HAVE THE INFRASTRUCTURE FOR SURVEILLANCE. HOWEVER, WE WILL PRESENT SOME NATIONAL DATA FROM NEPAL.

MODULE 3 OBJECTIVES

- TO UNDERSTAND THE MECHANISM OF ACTION OF ANTIBIOTICS
- TO UNDERSTAND PRESSURE AND RESISTANCE
- TO UNDERSTAND WHAT MULTIDRUG RESISTANCE IS AND ASSOCIATED RISKS
- TO INCREASE KNOWLEDGE ABOUT THE AMR SURVEILLANCE STRATEGY IN NEPAL
- TO INCREASE KNOWLEDGE ABOUT AMR PATTERNS IN NEPAL

BRIEF HISTORY OF ANTIBIOTICS



MECHANISM OF ACTION OF ANTIBIOTICS

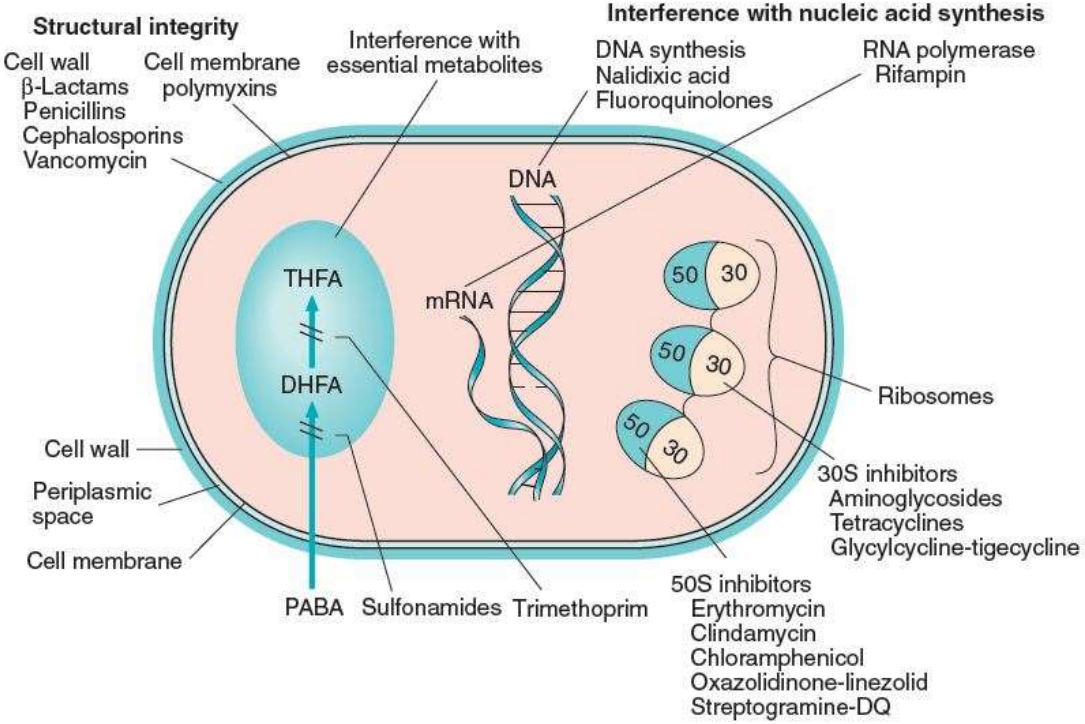


FIGURE 12-1 Primary sites of antibacterial action for major classes of antimicrobial agents. *DHFA,* dihydrofolic acid; P*ABA, para*-aminobenzoic acid; *THFA,* tetrahydrofolic acid.

MAHON CR, LEHMAN DC, MANUSELIS G. A TEXTBOOK OF DIAGNOSTIC MICROBIOLOGY 5TH ED

DEVELOPMENT OF RESISTANCE TO NEWLY INTRODUCED ANTIMICROBIALS

Agent	Year of FDA approval	First reported resistance
Penicillin	1943	1940
Streptomycin	1947	1947
Tetracycline	1952	1956
Methicillin	1960	1961
Nalidixic acid	1964	1966
Gentamycin	1967	1969
Vancomycin	1972	1987
Cefotaxime	1981	1981(AmpC) 1983(ESBL)
Linezolid	2000	1999

Bush K. ASM news.. 2004;70:282-287


What Causes Antibiotic Resistance?

MORE FREQUENT IN DEVELOPING COUNTRIES LIKE NEPAL

ANTIBIOTIC PRESSURE AND RESISTANCE IN BACTERIA

- ANTIBIOTICS ALSO KILL NON-PATHOGENIC MICROBES
- THIS REDUCES THE COMPETITION FOR THE RESISTANT PATHOGENS
- THE USE OF ANTIBIOTICS ALSO PROMOTES ANTIBIOTIC RESISTANCE IN NON- PATHOGENS
- THESE NON-PATHOGENS MAY LATER PASS THEIR **RESISTANT GENES** ON TO OTHER PATHOGENS

MULTIDRUG-RESISTANCE (MDR)

MULTIDRUG RESISTANCE IS A CONDITION ENABLING A DISEASE CAUSING ORGANISM TO RESIST DISTINCT DRUG AND CHEMICALS OF A WIDE VARIETY OF STRUCTURE AND FUNCTION TARGETED TO ERADICATE THE ORGANISM

MULTIDRUG-RESISTANCE ORGANISMS (MDROS)

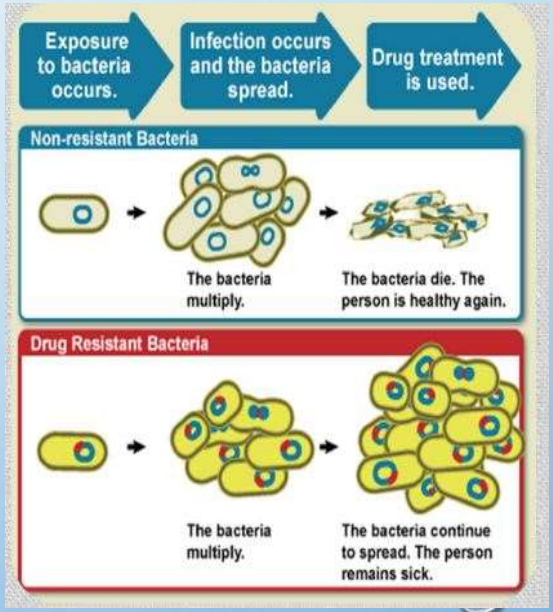
MULTIDRUG-RESISTANT ORGANISMS ARE BACTERIA THAT HAVE BECOME RESISTANT TO CERTAIN ANTIBIOTICS, AND THESE ANTIBIOTICS CAN NO LONGER BE USED TO CONTROL OR KILL THE BACTERIA


ANTIBIOTIC RESISTANCE
POSES A BIG THREAT TO
GLOBAL HEALTH
HANDLE
ANTIBIOTICS
WITH CARE
World Health
Organization


The crisis is mostly invisible
Usually we still do have at least one antibiotic active for each patient
But no new antibiotics + resistance is on the rise
Experts say we can fall anytime !

CONSEQUENCES OF ANTIMICROBIAL RESISTANCE

- COMPROMISED THERAPY OF HUMAN INFECTIONS
- SERIOUS COMPLICATIONS FOR ELDERLY AND CHILDREN
- INCREASED LENGTH OF THERAPY AND MORE DOCTOR VISITS
- PROLONGED HOSPITAL STAY AND SIGNIFICANT INCREASE OF TREATMENT COST
- "BACTERIAL RESISTANCE IS A MAJOR THREAT TO PUBLIC HEALTH"



INFECTIONS WITH RESISTANT ORGANISMS RESULT IN

- Higher morbidity
- Higher mortality
- Prolonged hospitalization
- Excess financial burden

INCREASING RESISTANCE: A SERIOUS & GLOBAL PROBLEM

Masterton RG. Int J Antimicrob Agents. 2009 Feb;33(2):105-10

AMR SURVEILLANCE IN NEPAL

OBJECTIVES OF AMR SURVEILLANCE

- Recognize the problem of AMR
- Detect emergence of AMR and monitor resistance patterns
- Trace source and spread of drug resistance
- Provide susceptibility data to physicians for directing therapy
- Formulate appropriate antibiotic policy guidelines
- Implement measures for prevention of AMR
- To interpret and integrate the resistance data to everyday practice of medicine
- To develop awareness among public and physicians regarding AMR and rational drug use

LAB-BASED AMR SURVEILLANCE: HOW DOES IT WORK?

Surveillance in Nepal started in 1999 with 9 laboratories monitoring six pathogens of interest

Enteric fever and food poisoning: *Salmonella* spp
Diarrheal illness: *Shigella* spp, *V.cholerae*
Blood stream and respiratory infections: *S.pneumoniae*, *H. influenzae*,
STD: *N.gonorrhoea*,
Complicated UTI: ESBL *E.coli*
Nosocomial pathogens: MRSA, MDR *Klebsiella* and *Acinetobacter* spp

Currently, 27 hospitals/laboratories are included in AMR surveillance of 10 organisms of interest

GENERAL OVERVIEW

1999

- *Shigella* spp
- *Vibrio cholerae*
- *Streptococcu spneumoniae*
- *H. influenzae*
- *Neisseria gonorrhoeae*

2002

- *Salmonella* Typhi and Paratyphi

2009

- ESBL producing *E. coli*

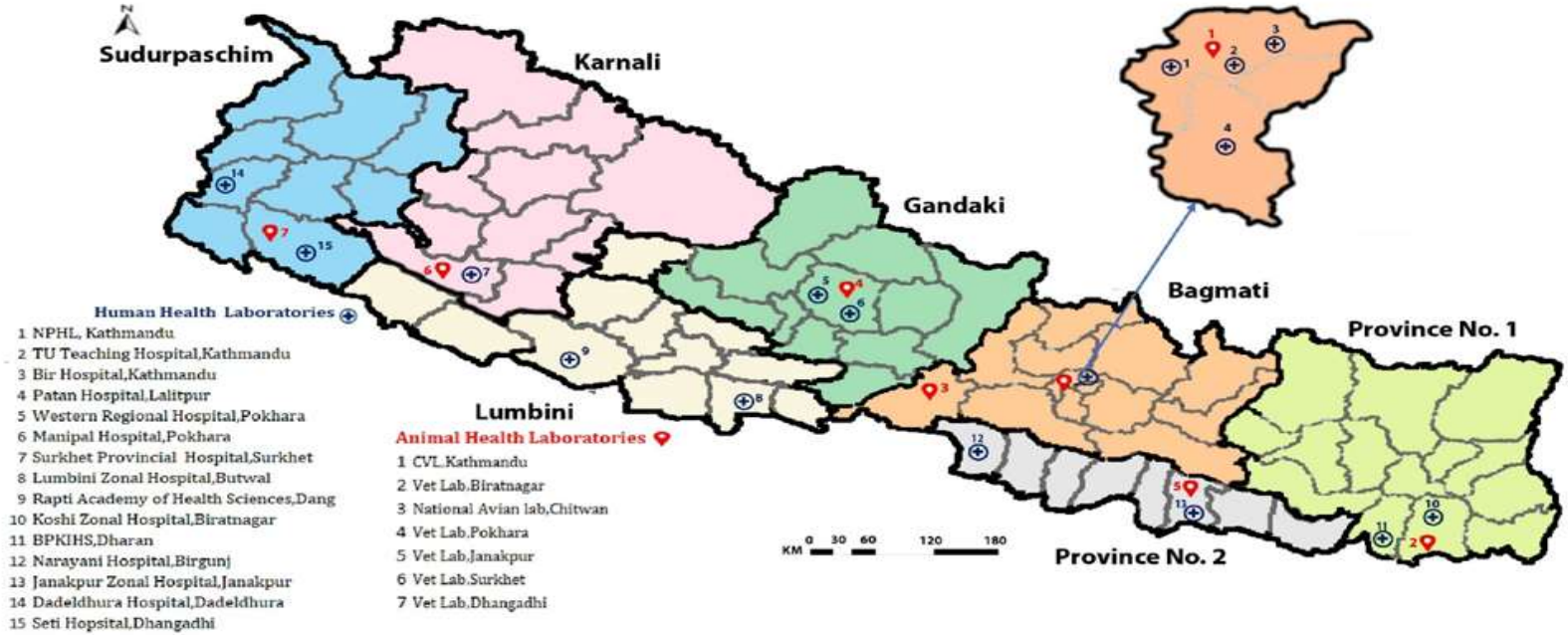
2013

- Methicillin resistant Staph. aureus (MRSA)

2016

- MDR Acinetobacter
- MDR Klebsiella

NEPAL SENTINEL SITES OF AMR SURVEILLANCE



SURVEILLANCE METHODS

At Sites

- Sample received and processed following standard microbiological techniques
- Organism of interest are isolated, identified and reported along with the AST pattern

Interlink

- Monthly Data on AST along with 10% isolates are sent to NPHL
- NPHL verifies the isolates and send feedback

NPHL

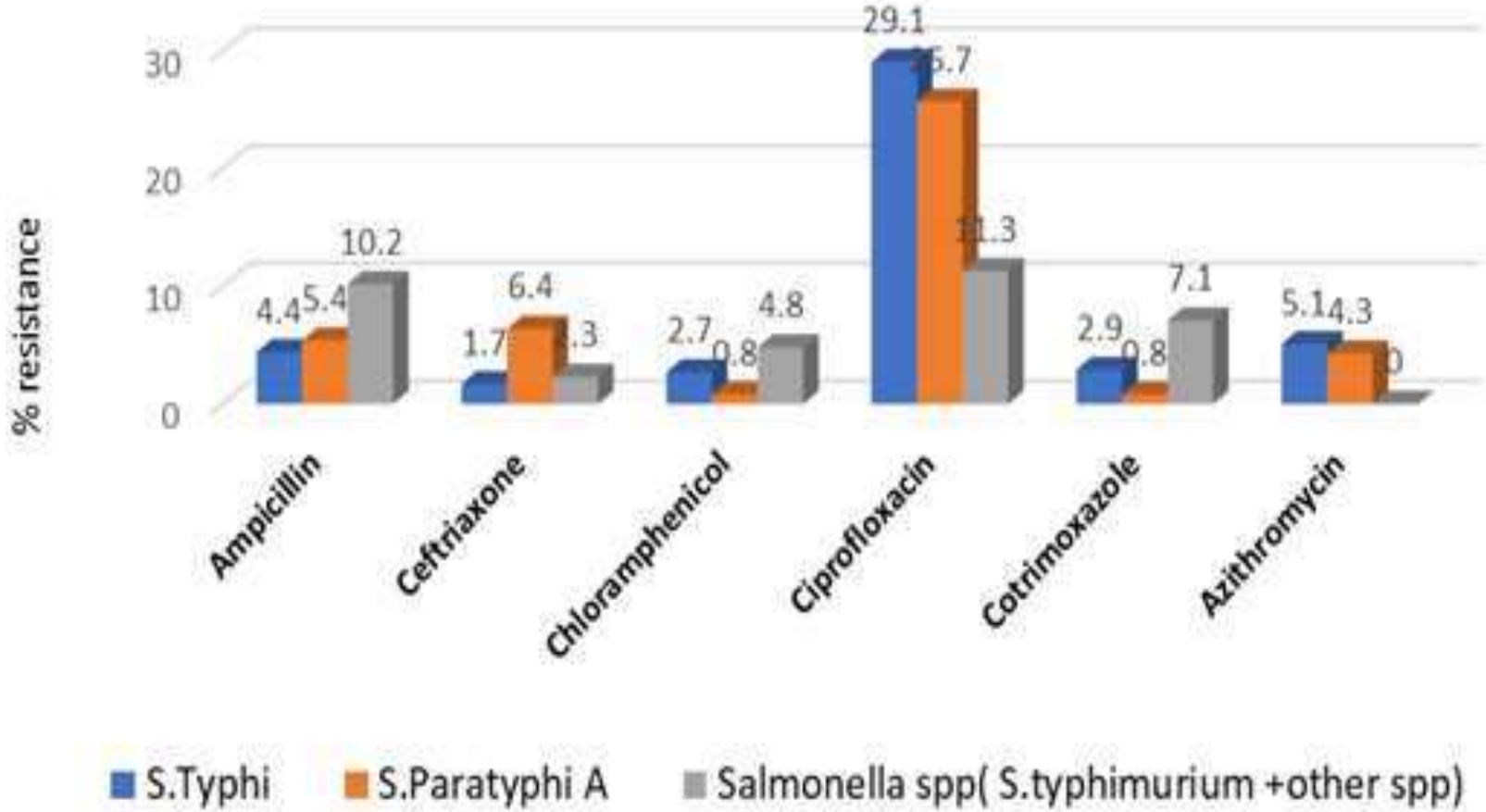
- Data from all sentinel sites are compiled, analyzed and disseminated annually

HIGHLIGHTS FROM NATIONAL **AMR** SURVEILLANCE (2019)

SALMONELLA

- A TOTAL OF 565 SALMONELLA WERE RECOVERED FROM 39,997 BLOOD CULTURES REPORTED IN 2019.
  - 64.4 % WERE SALMONELLA ENTERICA SEROVAR TYPHI (364/565),
  - 23.8 % WERE SALMONELLA ENTERICA SEROVAR PARATYPHI (135/565)
  - 9.9% (58/557) WERE SALMONELLA SPP.
- INFECTION WAS HIGHER IN MONSOON (JUNE -AUGUST)
- CASES WERE SLIGHTLY HIGHER IN FEMALES
- PATIENTS OF 11-20 YEARS AGE GROUP WERE COMMONLY AFFECTED IN BOTH SEXES.

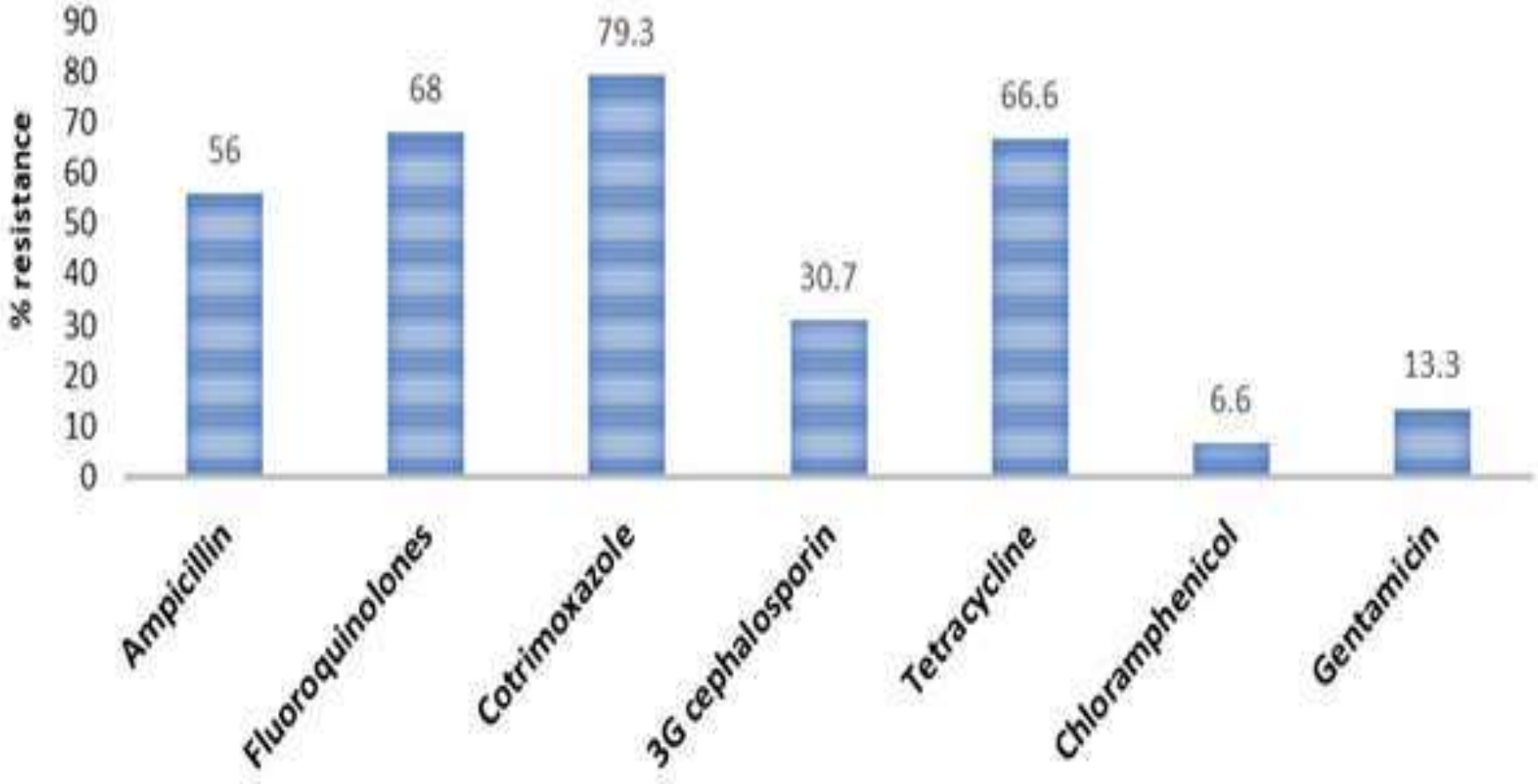
Figure 1: Comparative antibiogram of Salmonella spp,2019 (n=549)



SHIGELLA

- OUT OF 2802 STOOL CULTURES, 33 YIELDED SHIGELLA
  - *57.5% SHIGELLA* SPP
  - 21.2% *S. SONNEI*
  - *15.5% S. FLEXNERI*
  - *6.06% S. BOYDII*
- ISOLATION OF SHIGELLA WAS HIGHER IN 11-20 YEARS AGE GROUP IN BOTH SEXES
- 45.4% SHIGELLA ISOLATES WERE MDR (AT LEAST ONE AGENT IN ≥3 CLASSES OF ANTIBIOTIC)

FIGURE 2: ANTIBIOGRAM OF SHIGELLA SPP,2019 (N=33)



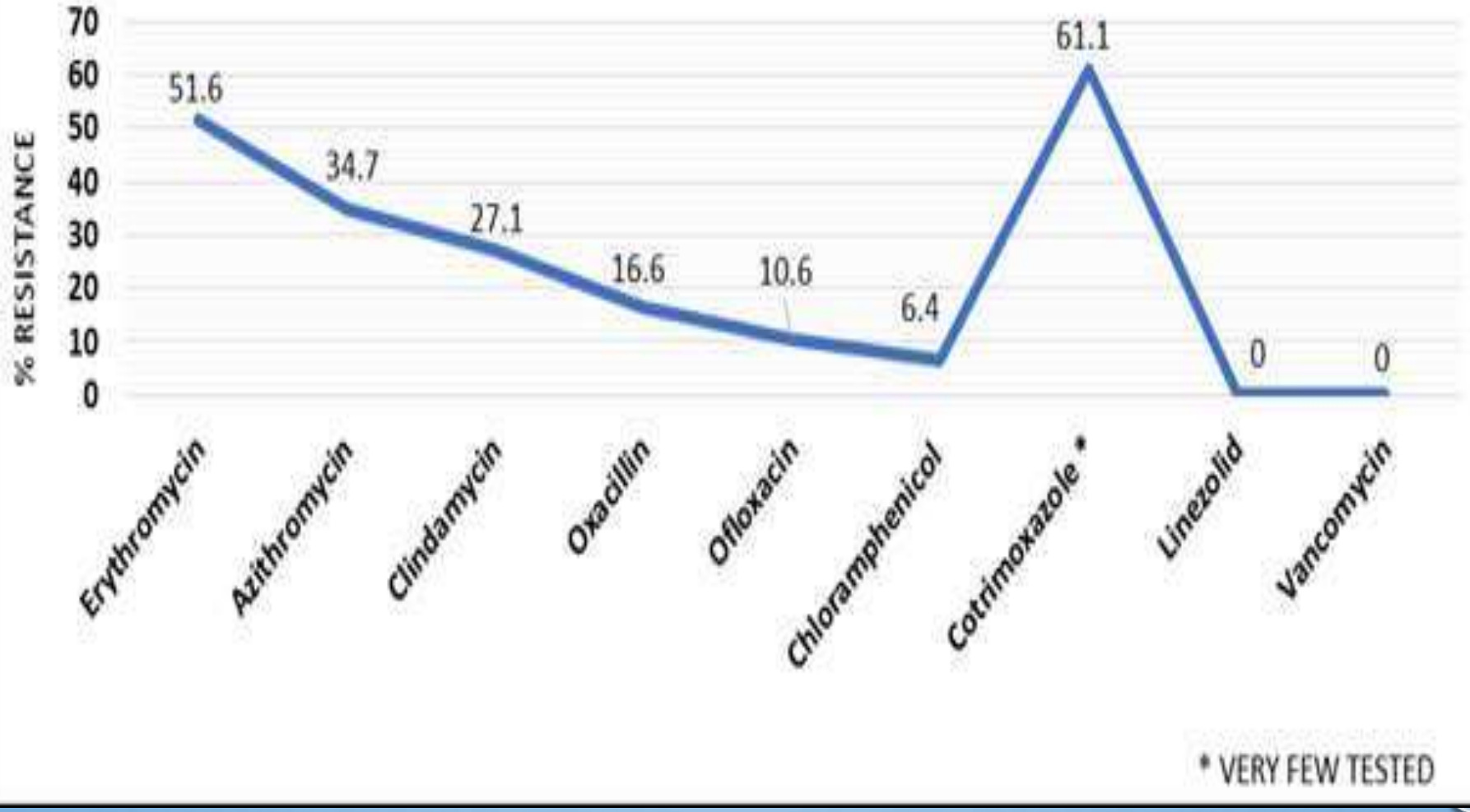
VIBRIO CHOLERAE

- ONLY 1 *V. CHOLERAE* O1 OGAWA WAS REPORTED IN 2019
- THE ISOLATE WAS SUSCEPTIBLE TO AMPICILLIN AND TETRACYCLINE BUT RESISTANT TO COTRIMOXAZOLE AND NALIDIXIC ACID

STREPTOCOCCUS PNEUMONIAE

- A TOTAL OF 82 *S. PNEUMONIAE* ISOLATES WERE REPORTED
- MOST OF THE ISOLATES WERE RECOVERED FROM BLOOD (34) FOLLOWED BY RESPIRATORY SAMPLE (24)
- INFECTION WAS HIGHER IN 1-15 YEARS AGE GROUP IN BOTH SEXES.
- ALL THE ISOLATES WERE SENSITIVE TO LINEZOLID AND VANCOMYCIN
- OF THE TOTAL ISOLATES, 23.1% WERE RESISTANT TO 1 ANTIBIOTIC CLASS, 19.5% WERE RESISTANT TO 2 CLASSES OF ANTIBIOTIC
- **9.7% ISOLATES WERE MDR**

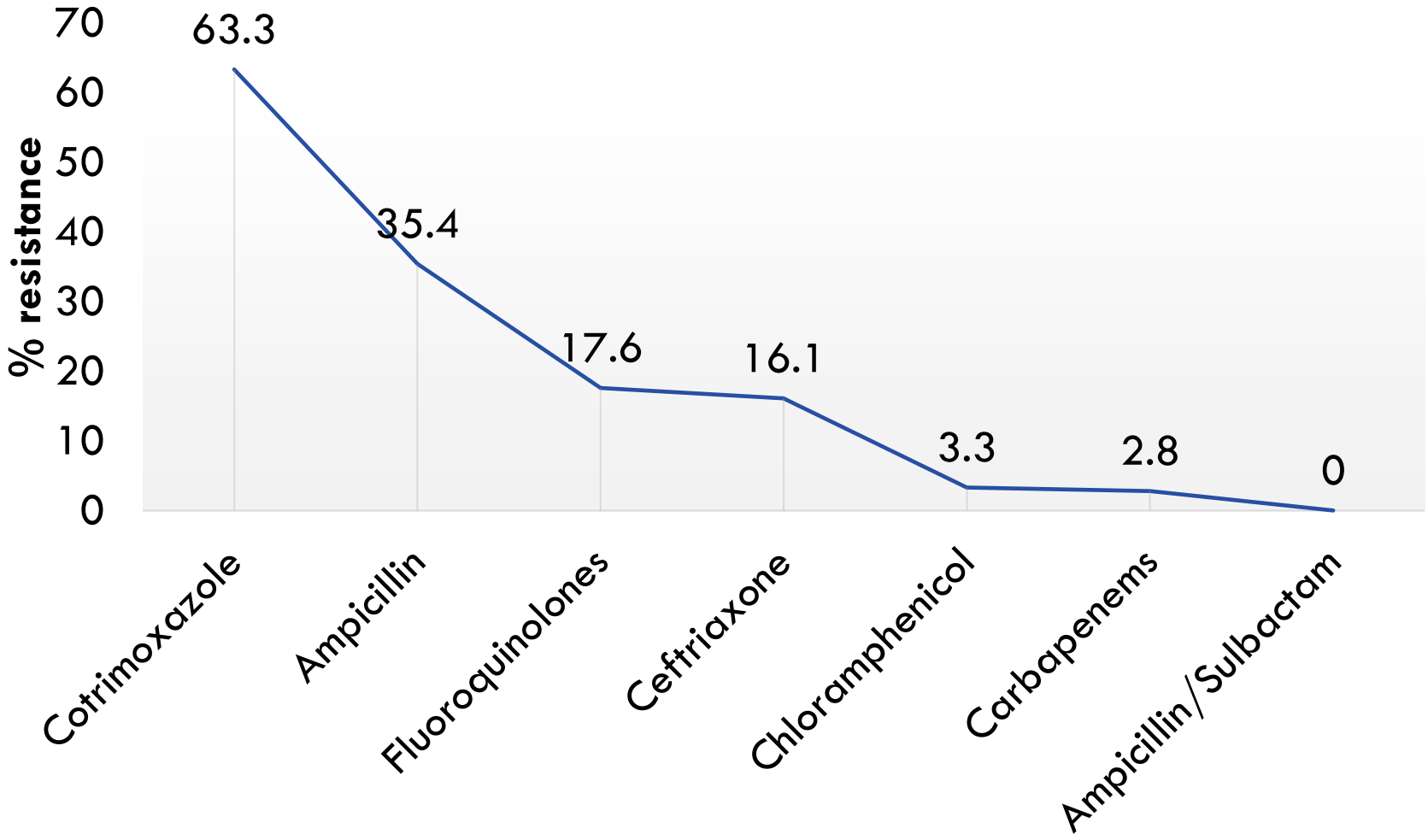
Figure 5: Antibiogram of *S.pneumoniae* isolates,2019 (n=82)



HAEMOPHILUS INFLUENZAE

- ONLY 35 ISOLATES OF H. INFLUENZAE WERE REPORTED
- SAMPLE WISE DISTRIBUTION SHOWS 88.5% WERE RECOVERED FROM RESPIRATORY SAMPLE, FOLLOWED BY 8.5% FROM PUS AND 2.8% FROM BLOOD
- ISOLATION WAS HIGHER IN 46-60 YEARS AGE GROUP IN CASE OF MALES, WHEREAS, FROM 61-75 YEARS AGE GROUP IN FEMALES
- **11.4 %** (4/35) WERE **MDR**

Figure : Antibiogram of H.influenzae isolates,2019 (n=35)



NEISSERIA GONORRHOEAE

- ONLY 14 ISOLATES OF *NEISSERIA GONORRHOEA* WERE REPORTED
- 85% ISOLATES WERE RECOVERED FROM MALES OF 15-30 YEARS AGE GROUP
- SINCE CLSI RECOMMENDS DOING MIC FOR TESTING ANTIBIOTICS AGAINST *NEISSERIA*, ONLY 4 ANTIBIOTICS WERE REPORTED
- THE ANTIBIOGRAM OF *N. GONORRHOEA* ISOLATES SHOWS
  - 71.4% (10/14) RESISTANCE TO CIPROFLOXACIN,
  - 28.5% (4/14) RESISTANCE AGAINST CEFTRIAXONE,
  - 100% RESISTANCE TO COTRIMOXAZOLE AND LEVOFLOXACIN (ONLY 4 ISOLATES TESTED)

METHICILLIN RESISTANT *S. AUREUS* (MRSA)

- A TOTAL OF 3101 *STAPHYLOCOCCUS AUREUS* WERE REPORTED IN 2019 FROM VARIOUS SAMPLES OF WHICH **943(30.4%)** WERE METHICILLIN RESISTANT
- THE PROPORTION OF MRSA RANGED BETWEEN 5.2% TO 77% DEPENDING ON SAMPLE, INSTITUTION AND CULTURE LOAD
- MRSA ISOLATES SHOWED HIGH RESISTANCE AS COMPARED TO NON-MRSA.
- HALF OF THE MRSA **(50.5%)** ISOLATES WERE **MDR**

Figure 9 : Comparative antibiogram of MRSA (n=943) vs Non MRSA isolates (n=2435)

	Macrolides (Ery/Azt)	CHL	LEV *	CIP	CD	COT	Tetracyclines * (Dox/Tet)	GM	Penicillin G*	Linezolid *
MRSA (%R)	69.50%	4.40%	42.50%	74.60%	53.40%	27.30%	10.50%	38.10%	100%	0.00%
Non-MRSA (%R)	51.20%	5.10%	11.68%	48.50%	32.60%	31.70%	4.90%	11.80%	84.70%	8.60%

MRSA (%R) Non-MRSA (%R)

ESBL *E. COLI*

- A TOTAL OF 10,984 ISOLATES OF *ESCHERICHIA COLI* WERE REPORTED FROM 15 SURVEILLANCE SITES OF WHICH ONLY 8 PERFORMED PHENOTYPIC TESTS FOR CONFIRMATION OF ESBL PRODUCTION
- PRIMARY SCREENING (RESISTANCE TO THIRD GENERATION CEPHALOSPORIN) SHOWED 9523 (86.6%) ISOLATES WERE SUSPECTED ESBL PRODUCERS, WHEREAS ONLY 620 (5.6%) ISOLATES WERE PHENOTYPICALLY CONFIRMED AS ESBL PRODUCERS
- MOST OF THE ISOLATES WERE RECOVERED FROM URINE (80%) OF WHICH 6.5% WERE ESBL POSITIVE
- MOST OF THE ISOLATES WERE RECOVERED FROM FEMALES OF 21-30 YEARS AGE GROUP WHEREAS IN MALE RECOVERY RATE WAS HIGHER IN 51-60 YEARS AGE GROUP

MDR *KLEBSIELLA SPP*

- A TOTAL OF 3374 *KLEBSIELLA* ISOLATES WERE REPORTED
- OF THE TOTAL ISOLATES, 1201 **(35.5%)** WERE **MDR**

Figure 16: Comparative Antibiogram of *Klebsiella* spp

	Amino glycosides	Beta lactam combination	Fluoro quinolones	Carba penems	Tetracyclines	Chloramphenicol	Cotrimoxazole	Nitrofurantoin *	Cephalosporin
Non MDR Klebsiella	32.6	45.7	38.8	27.3	59.5	50.7	49.4	39.9	60.9
MDR Klebsiella	64.1	78.1	88.04	57.01	71.4	71.1	90.4	78.1	96.7

Non MDR Klebsiella MDR Klebsiella

MDR *ACINETOBACTER SPP*

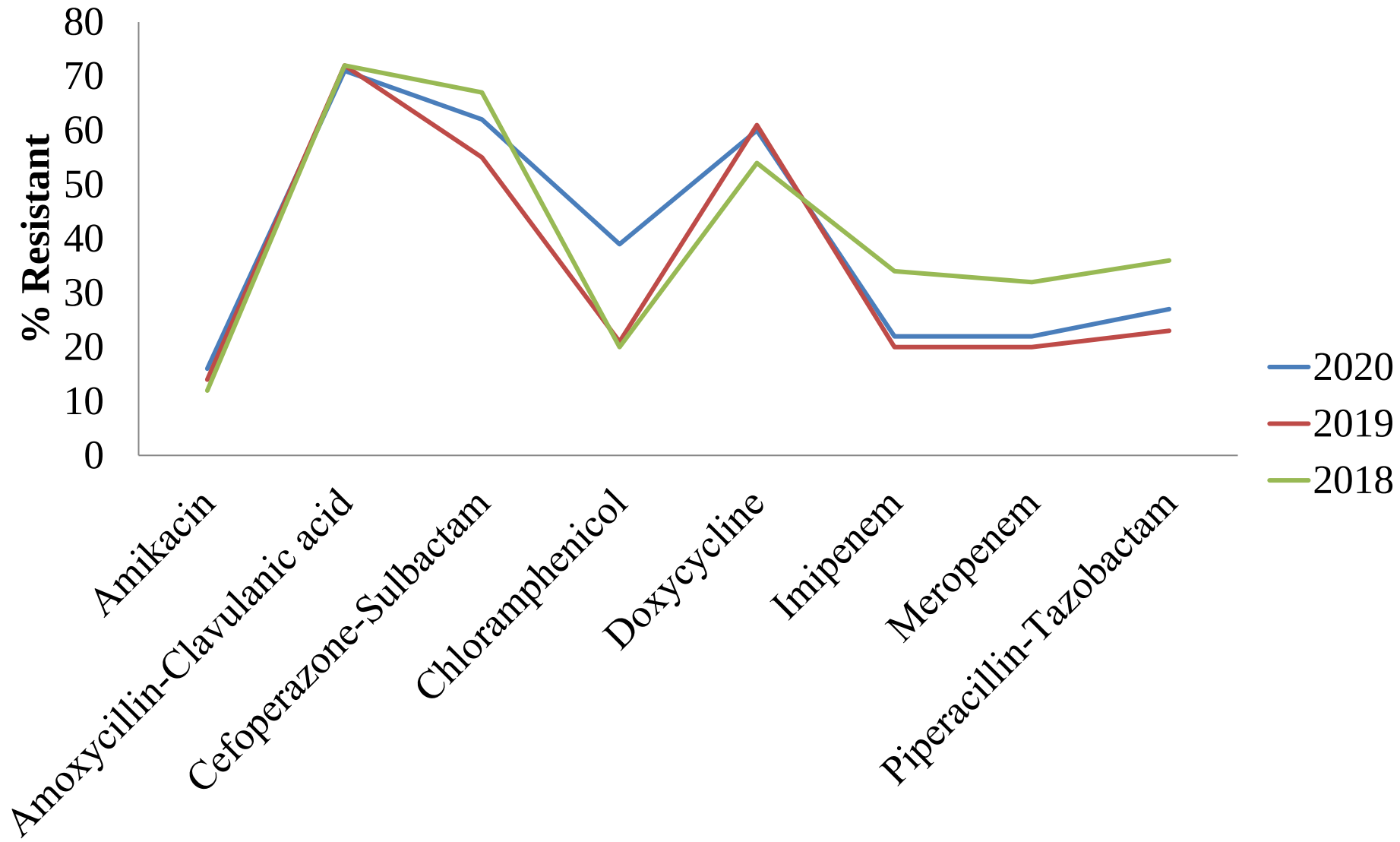
- A TOTAL OF 1546 ACINETOBACTER SPP WERE REPORTED
- **496 (32.8%)** WERE **MDR**
- MDR ISOLATES WERE HIGHLY RESISTANT TO ALL TESTED ANTIBIOTICS AS COMPARED TO NON-MDR ISOLATES

Figure 19: Comparative antibiogram of MDR and non MDR

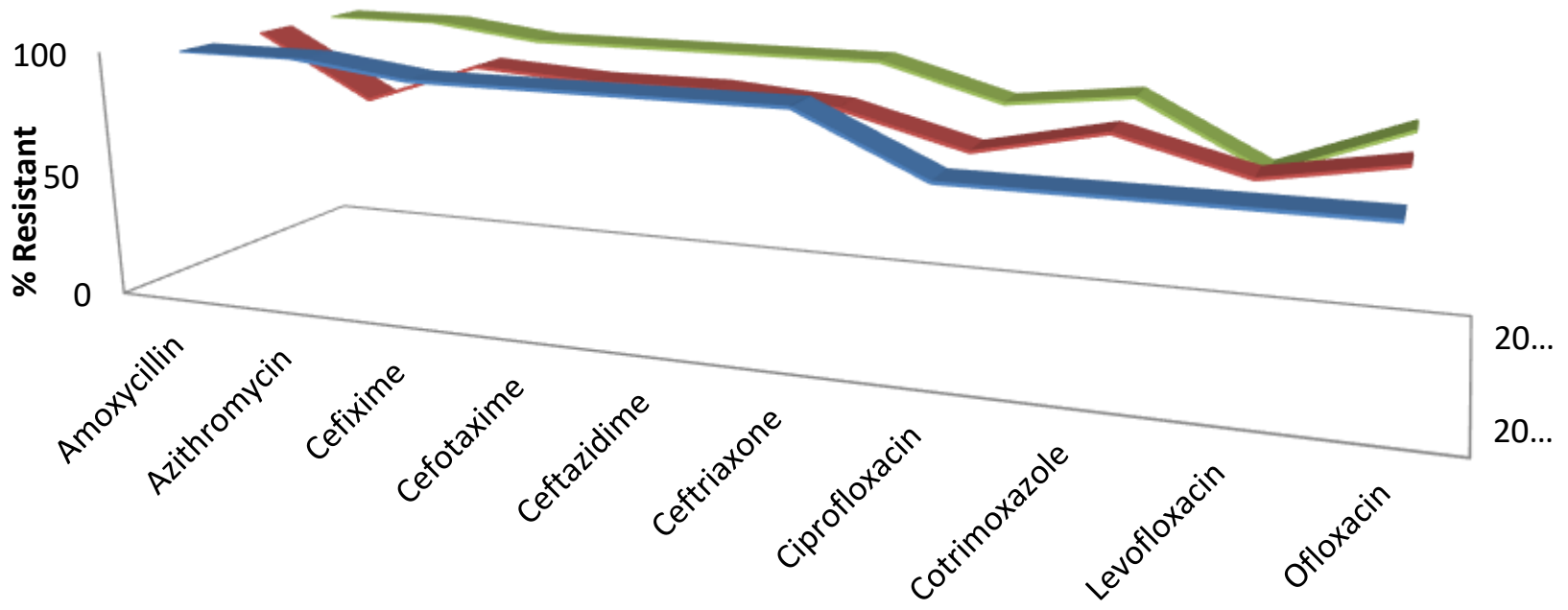
Acinetobacter spp

	Aminoglycosides	Beta lactam combination	Fluoroquinolones	Carbapenems	Tetracyclines	Cotrimoxazole	Nitrofurantoin *	Cephalosporin
Non-MDR Acinetobacter	37.8	35.1	39.5	30.5	79.6	50.5	55.8	72.5
MDR Acinetobacter	90.1	83.8	95.8	87.3	66.2	88.5	92.3	96.8

AMR trends of E. coli (Kathmandu Model Hospital)



3 years AMR trends of ACBC (Kathmandu Model Hospital)



	Amoxycillin	Azithromycin	Cefixime	Cefotaxime	Ceftazidime	Ceftriaxone	Ciprofloxacin	Cotrimoxazole	Levofloxacin	Ofloxacin
2020	100	100	94	94	94	94	71	71	71	71
2019	100	74	91	88	88	84	71	82	69	78
2018	100	100	94	94	94	94	80	86	60	80

CONSTRAINTS TO REDUCING AMR IN NEPAL

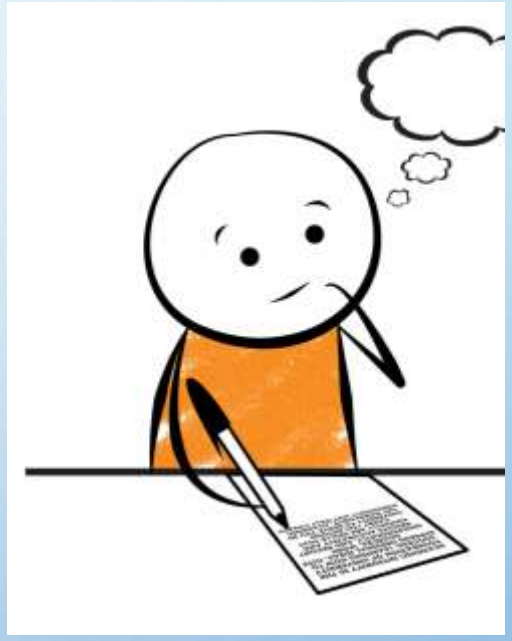
- LACK IN COMMUNICATION BETWEEN HUMAN HEALTH, VETERINARY AND OTHER SECTORS
- LACK OF REGULATORY BODIES
- NO STRICT LAW AGAINST VIOLATORS
- LACK OF GOOD INFRASTRUCTURE AND DEDICATED HUMAN RESOURCE
- LACK OF A NATIONAL LMIS

TAKE HOME MESSAGES

- BACTERIAL RESISTANCE MIGHT BE THE MAJOR HEALTH PROBLEM AHEAD
- IT'S AN GLOBAL **ECOLOGICAL** PHENOMENOM
- NO PART OF THE WORLD WILL BE SPARED
- FIRST DECREASE MASSIVELY ALL UNNECESSARY ANTIBIOTIC USAGE

TAKE HOME MESSAGES

- **HOWEVER,** LET'S NOT BE TOO PESSIMISTIC
- THE SITUATION OF AMR IS HIGHLY CRITICAL
- BUT
  - WE CAN (AT LEAST) STABILIZE AMR BY REDUCING MISUSE AND OVERUSE OF ANTIBIOTICS
  - UNTIL NEW DRUGS AND TREATMENTS EMERGE IN THE MARKET



DISCUSSION QUESTIONS

- WHAT IS MULTIDRUG RESISTANCE? WHAT ARE THE CHALLENGES WE FACE WITH MULTIDRUG RESISTANCE?
- WHAT ARE SOME OF THE RISKS ASSOCIATED WITH AMR/MDR?
- WHY IS IT IMPORTANT TO UNDERSTAND PATTERNS OF RESISTANCE IN DIFFERENT PATHOGENS?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 4: THE ROLE OF NURSES AND MIDWIVES IN HOSPITAL- AND COMMUNITY-BASED STEWARDSHIP

MODULE 4 OBJECTIVES

- TO UNDERSTAND THE GLOBAL AND NATIONAL RESPONSE TO AMR THROUGH AMR ACTION PLANS
- INCREASE KNOWLEDGE ABOUT HOW ANTIBIOTIC USE CAN BE CHANGED TO DECREASE RISKS OF AMR
- INCREASE KNOWLEDGE OF HOW NURSES AND MIDWIVES CAN CONTRIBUTE TO AMR STEWARDSHIP IN HOSPITALS AND COMMUNITIES

GLOBAL AND NATIONAL ACTION PLANS

1. Improve awareness and understanding of AMR	2. Strengthen knowledge through surveillance and research	3. Reduce the incidence of infection	4. Optimize the use of antimicrobial medicines	5. Ensure sustainable investment in countering antimicrobial resistance
Risk communication	National AMC and AMR surveillance	IPC, WASH, HAI	Access to qualified antimicrobial medicines, regulation, AMS	Measuring the burden of AMR
Education	Laboratory capacities	Community level prevention	Use in veterinary and agriculture	Assessing investment needs
	Research and development	Animal health: prevention and control		Establishing procedures for participation

AWARENESS AND UNDERSTANDING

- ANTIBIOTICS ARE **KEY TO TREATMENT OF CERTAIN BACTERIAL INFECTIONS** (E.G., URINARY TRACT INFECTIONS, STREP THROAT)
- ANTIBIOTICS **MAY NOT BE NEEDED FOR SOME BACTERIAL INFECTIONS** (E.G., EAR OR SINUS INFECTIONS)
- ANTIBIOTICS SHOULD **NEVER BE USED FOR VIRAL INFECTIONS**
  - COLDS
  - INFLUENZA
  - COVID 19

https://www.cdc.gov/antibiotic-use/community/about/should-know.html

AMR IN THE COMMUNITY

- EVIDENCE SUGGESTS THAT A MAJORITY OF MULTI-DRUG RESISTANT (MDR) PATHOGENS ARE IN THE ENVIRONMENTS AND THESE INFECTIONS ARE OFTEN COMMUNITY ACQUIRED;
- GLOBAL DATA SUGGEST THAT **85% TO 95%** OF ANTIBIOTIC DISPENSING OCCURS WITHIN COMMUNITIES;

OPTIMIZING USE OF ANTIBIOTICS

- DO NOT OVERPRESCRIBE ANTIBIOTICS (E.G., FEVER WITHOUT EVIDENCE OF INFECTION)
- SAVE USE OF BROAD SPECTRUM ANTIBIOTICS (AWARE CATEGORIES FOR ANTIBIOTICS)
- TAKE CARE WITH DOSING. BOTH OVER AND UNDER DOSING CONTRIBUTE TO RESISTANCE
- FOLLOW RECOMMENDATIONS/GUIDELINES IN TERMS OF DOSE INTERVALS (E.G., TOO MUCH TIME BETWEEN DOSES)
- FOLLOW RECOMMENDATIONS/GUIDELINES ON DURATION

OPTIMIZING USE OF ANTIBIOTICS

- WHAT IS AWARE?
  - THE WHO HAS CLASSIFIED COMMONLY USED ANTIBIOTICS INTO THREE GROUPS: **ACCESS, WATCH, RESERVE**
    - **ACCESS**: THIS GROUP INCLUDES ANTIBIOTICS AND ANTIBIOTICS CLASSES THAT HAVE ACTIVITY AGAINST A WIDE RANGE OF COMMONLY ENCOUNTERED SUSCEPTIBLE PATHOGENS. THESE ARE ESSENTIAL FIRST- AND SECOND-CHOICE EMPIRICAL TREATMENT OPTIONS FOR SPECIFIC INFECTIOUS SYNDROMES E.G., AMOXICILLIN, AMPICILLIN, CEFALEXIN, CHLORAMPHENICOL, CLOXACILLIN, DOXYCYCLINE, SULFAMETHOXAZOLE + TRIMETHOPRIM
    - **WATCH**: THIS GROUP INCLUDES ANTIBIOTICS AND ANTIBIOTIC CLASSES THAT HAVE A HIGHER RESISTANCE POTENTIAL. THESE ARE ESSENTIAL FIRST AND SECOND-CHOICE EMPIRICAL TREATMENT OPTIONS FOR A LIMITED NUMBER OF INFECTIOUS SYNDOMES, E.G., **AZITHROMYCIN, CEFIXIME, CEFOTAXIME CIPROFLOXACIN, VANCOMYCIN**
    - **RESERVE:** THIS GROUPS SHOULD BE RESERVED FOR CONFIRMED OR SUSPECTED MULTIDRUG RESISTANT ORGANISMS. **THEY SHOULD BE CONSIDERED LAST RESORT OPTIONS**. E.G., CEFTAZIDIME + AVIBACTAM COLISTIN FOSFOMYCIN (INTRAVENOUS) LINEZOLID MEROPENEM + VABORBACTAM PLAZOMICIN POLYMYXIN B

ANTIMICROBIAL STEWARDSHIP

- THERE ARE MANY EVIDENCE-BASED AMS INTERVENTIONS
- **EDUCATION**
  - **FORMAL/ INFORMAL**
  - **GUIDELINES**
- FEEDBACK
  - AUDIT WITH FEEDBACK
  - WARD ROUNDS
- STRUCTURE
  - SELF-REVISION BY PRESCRIBER
  - COMPUTERIZED ORDER ENTRY
- RESTRICTION
  - PRE-AUTHORIZATION
  - AUTOMATIC STOP ORDERS

AMS: HOSPITAL-BASED NURSES AND MIDWIVES

- HOSPITAL-BASED NURSES AND MIDWIVES CAN SIGNIFICANTLY IMPACT AMR THROUGH THEIR PRACTICE
  - IN-TAKE INFORMATION ABOUT PATIENTS INCLUDING MEDICATION ALLERGIES AND PAST AND CURRENT ANTIBIOTIC USE
  - ANTIMICROBIAL ADMINISTRATION
    - TIMELY
    - CORRECT DRUG, ROUTE, DURATION
  - PATIENT MONITORING
    - MONITORING
    - REPORTING EVIDENCE OF INFECTION
    - MONITORING ADVERSE EVENTS RELATED TO MEDICATIONS

AMS: NURSES AND MIDWIVES

- HOSPITAL-BASED NURSES AND MIDWIVES CAN SIGNIFICANTLY IMPACT AMR THROUGH THEIR PRACTICE
  - PARTICIPATING IN AMS AND IPC TEAMS/COMMITTEES TO SUPPORT STEWARDSHIP AND GOOD PRACTICES TO CONTROL SPREAD OF INFECTIONS;
  - SUPPORT AND ENGAGE IN AMR/AMS/IPC EDUCATION AND TRAININGS;
  - DISCUSSING DISCHARGE PLANS, PROPER USE OF PRESCRIBED ANTIBIOTICS AND OTHER MEDICATIONS, INFORMATION ON POTENTIAL ADVERSE EVENTS THAT MIGHT BE ASSOCIATED WITH PRESCRIBED ANTIBIOTICS
  - PATIENT AND COMMUNITY EDUCATION ABOUT AMR, INFECTION PREVENTION AND CONTROL

AMS: COMMUNITY NURSES AND MIDWIVES

- STEWARDSHIP PRACTICES FOR COMMUNITY-BASED NURSES AND MIDWIVES:
  - BECOME AMS AND IPC CHAMPIONS WITHIN COMMUNITY CLINICAL SETTINGS;
  - DEFINE IPC POLICIES AND ENSURE THAT THOSE POLICIES ARE PRACTICED;
  - AT THE CLINIC AND THROUGH OUTREACH EFFORTS, EDUCATE PATIENTS AND COMMUNITY MEMBERS ABOUT AMR, STEWARDSHIP, AND IPC;
  - WHEN POSSIBLE, REFER PATIENTS WHO MIGHT REQUIRE ANTIBIOTICS TO A FACILITY WITH A PHYSICIAN/LABORATORY;
  - IF NEED TO DISPENSE ANTIBIOTICS, USE LOCAL GUIDELINES REGARDING TYPE OF ANTIBIOTIC AND DURATION

DISCUSSION QUESTIONS

- HOW CAN ANTIBIOTIC USE BE OPTIMIZED TO REDUCE RISK FOR AMR?
- WHAT ARE THE AWARE CATEGORIES AND HOW CAN THEY REDUCE RISK FOR AMR?
- WHAT ARE THE ROLES OF HOSPITAL NURSES IN STEWARDSHIP?
- WHAT ARE THE ROLES OF COMMUNITY NURSES/MIDWIVES IN STEWARDSHIP?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 5: ANTIBIOTIC AND OTC GUIDELINES FOR COMMUNITY NURSES AND MIDWIVES

MODULE 5 OBJECTIVES

- INCREASE UNDERSTANDING OF BARRIERS TO OPTIMAL ANTIBIOTIC USE
- REVIEW OF OTC MEDICINES WHICH CAN BE USED TO TREAT COMMON SYMPTOMS
- INCREASE UNDERSTANDING OF RISKS ASSOCIATED WITH ANTIBIOTIC USE IN CHILDREN AND ADULTS
- REVIEW OF ANTIBIOTICS WHICH MIGHT BE PRESCRIBED BY PHYSICIANS FOR COMMON COMMUNITY ACQUIRED INFECTIONS

BEHAVIOR CHANGE: NECESSARY TO REDUCE AMR

- COMMUNITY NURSES & MIDWIVES ARE FRONTLINE WORKERS WHO ARE EXTREMELY ACCESSIBLE TO PATIENTS

The pressure to prescribe/provide antibiotics to patients, despite the presence of viral infections and the high patient expectation of receiving antibiotics

Use of alternative symptomatic relief medication and information that viral infections cannot be treated by antibiotics.

COMMON RECOMMENDATIONS FOR SYMPTOM MANAGEMENT IN ADULTS

Symptoms	Home remedies	Over the counter medication (Adults only)	Active ingredient (Common brand names)
Stuffy nose	Vaporizer or humidifier	-Saline nasal spray -Oral Decongestant: opens up nasal passages (avoid if you have high blood pressure)	□ Saline □ Phenylephrine □ Pseudoephedrine
Runny nose; itchy, watery eyes; sneezing	-For red, raw nose, put petroleum jelly on the exterior -Use tissue with lotion - Avoid smoke	Antihistamine: dries you up and may relieve itchy eyes	□ Diphenhydramine □ Chlorpheniramine □ Loratadine □ Cetirizine □ Fexofenadine
Dry cough	Vaporizer or humidifier	Cough suppressant: helps stop cough	□ Dextromethorphan
Wet cough	Drink more fluids	Expectorant: thins mucus, makes it easier to cough up	□ Guaifenesin
Sore throat	-Gargle with warm salt water -Avoid smoke -Drink tea	Throat lozenges: soothes throat (choose a sugar-free option if you have diabetes)	□ Menthol or Benzocaine
Fever, muscle aches	-Bed rest -Cool or warm compresses	Analgesic: pain reliever (use caution if you are taking blood thinners)	□ Acetaminophen □ Aspirin □ Ibuprofen Naproxen

BEHAVIOR CHANGE: NECESSARY TO REDUCE AMR

A lack of knowledge and awareness of AMR and optimal antibiotic use among clinicians and patients can drive inappropriate antibiotic use

Raising awareness about AMR, appropriate antibiotic use, and the need to have strict adherence to prescription-only antibiotics

WHEN ARE ANTIBIOTICS INDICATED? EXAMPLE OF PATIENT INFORMATION

Common Condition	Common Cause			Are Antibiotics Needed?
	Bacteria	Bacteria or Virus	Virus	
Strep Throat	✔			Yes
Urinary tract infection	✔			Yes
Sinus Infection (sinusitis)		✔		Maybe
Ear Infection		✔		Maybe
Bronchitis/chest cold		✔		No
Common cold/runny nose			✔	No
Sore throat			✔	No
Flu			✔	No

WHAT ABOUT WHEN ANTIBIOTICS COULD BE WARRANTED?

Recommend antibiotics with appropriate spectrum of activity and for the shortest duration for adequate therapy!

Refer patients, especially children, to acute care facilities for severe infections or when antibiotics did not improve symptoms.

ANTIBIOTIC USE IN CHILDREN: PROCEED WITH CAUTION!

- ANTIBIOTIC SELECTION, DOSAGES, AND DURATIONS OF TREATMENT ARE DIFFERENT FOR CHILDREN!
- SEVERAL ANTIBIOTICS ARE ASSOCIATED WITH HARM IN CHILDREN, SUCH AS:
  - PERMANENT TEETH DISCOLORATION
  - GASTRO-INTESTINAL DYSFUNCTION
  - ALLERGIC REACTIONS
    - HIVES/RASH
    - SHORTNESS OF BREATH/WHEEZING
    - **ANAPHYLAXIS**
- IN CASES WHERE CHILDREN MIGHT REQUIRE ANTIBIOTICS, IT IS HIGHLY RECOMMENDED THEY SEE A DOCTOR

ANTIBIOTIC USE IN PREGNANT WOMEN

- ANTIBIOTICS ARE OFTEN PRESCRIBED DURING PREGNANCY.
- ALTHOUGH CHANGES IN BACTERIAL COMMUNITIES (DYSBIOSIS) ARE COMMONLY ASSOCIATED WITH DISEASE, SUCH CHANGES HAVE ALSO BEEN DESCRIBED IN HEALTHY PREGNANCIES, WHERE THE MICROBIOME PLAYS AN ESSENTIAL ROLE IN MATERNAL AND CHILD HEALTH OUTCOMES, INCLUDING NORMAL IMMUNE AND METABOLIC FUNCTION IN LATER LIFE.

ANTIBIOTIC USE IN PREGNANT WOMEN

- SAFETY OF ANTIBIOTIC USE DURING PREGNANCY DEPENDS ON VARIOUS FACTORS:
  - TYPE OF ANTIBIOTIC,
  - WHEN IN THE PREGNANCY THE ANTIBIOTIC IS TAKEN
  - HOW LONG THE ANTIBIOTIC IS TAKEN (DURATION)
  - POSSIBLE EFFECTS IT MIGHT HAVE ON THE PREGNANCY.

ANTIBIOTIC USE IN PREGNANT WOMEN

- SOME ANTIBIOTICS GENERALLY SEEN AS SAFE
  - PENICILLINS, INCLUDING AMOXICILLIN (AMOXIL, LAROTID) AND AMPICILLIN
  - CEPHALOSPORINS, INCLUDING CEFACLOR AND CEPHALEXIN (KEFLEX)
  - CLINDAMYCIN (CLEOCIN, CLINDA-DERM, CLINDAGEL)
- CERTAIN OTHER ANTIBIOTICS ARE BELIEVED TO POSE RISKS DURING PREGNANCY.
  - TETRACYCLINES CAN AFFECT BONE DEVELOPMENT AND DISCOLOR A DEVELOPING BABY'S TEETH. TETRACYCLINES AREN'T RECOMMENDED FOR USE AFTER THE FIFTH WEEK OF PREGNANCY.
  - SULFONAMIDES MIGHT POSE A SMALL RISK OF HEART CONDITIONS, CLEFT LIP OR PALATE, AND JAUNDICE. SULFONAMIDES ARE GENERALLY AVOIDED DURING THE FIRST TRIMESTER OF PREGNANCY AND NEAR THE TIME OF DELIVERY

Mayo Clinic. Pregnancy Week by Week.
https://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/expert-answers/antibiotics-and-pregnancy/faq-20058542

GENERAL GUIDELINES FOR DISPENSING ANTIBIOTICS (ADULTS)

LOWER RESPIRATORY TRACT INFECTIONS (ADULTS)

Diagnosis	Suspected Pathogens	Empiric treatment	Duration of Therapy
Pneumonia, community-acquired	*S. Pneumoniae* *H. influenzae* *Mycoplasma* sp. *Chlamydophila* sp. *Legionella* sp.	• Amoxiclav PO 625mg q8h <u>Alternatives:</u> • Moxifloxacin PO 400 q24h • Azithromycin PO 500 mg q24h	• 5 days with symptom resolution

SKIN AND SKIN STRUCTURE INFECTIONS (ADULTS)

Diagnosis	Suspected Pathogens	Empiric treatment	Duration of Therapy
Skin and skin structure infections Cellulitis, no abscess	Streptococci	Cellulitis, oral therapy: • Cephalexin 500mg q6h Alternatives • Cloxacillin 500mg q8h or Flucloxacillin PO 500mg q6	• 5-7 days
Abscess, with drainage	Staphylococci, MRSA or MSSA	• Doxycycline PO 100 mg q12h • Amoxiclav PO 625mg q8h • Clindamycin PO 300 mg q 8h Alternatives • Flucloxacillin PO 500mg q6hr Cotrimoxazole PO 800/160 mg q12h	• 5 days, with adequate surgery for drainage

URINARY TRACT INFECTIONS (ADULTS)*

Diagnosis	Suspected Pathogens	Empiric treatment	Duration of Therapy
Lower urinary tract Urinary discomfort, no fevers, generally younger women	*E. Coli* Other *Enterobacterales*	• Nitrofurantoin PO 100 mg q6hr • Pregnant women ONLY: Cefixime PO 400mg q6h <u>Alternatives:</u> • See below recommendations	• 5 days • 7 days
Upper urinary tract infection Fevers, upper kidney pain		• Ciprofloxacin PO 500 mg q 12 h, or • Cotrimoxazole PO 800/160 mg q12h	• 3 days for either drug • 7 days for either drug

**E. coli* are often multi-drug resistant organisms. Lack of response to antibiotic treatment could warrant additional testing for resistance

DISCUSSION QUESTIONS

- WHAT ARE SOME CONDITIONS FOR WHICH ANTIBIOTICS SHOULD NOT BE PRESCRIBED/DISPENSED?
- HOW CAN DISPENSING OVER-THE-COUNTER SYMPTOM RELIEF MEDICATIONS HELP TO DECREASE ANTIBIOTIC RESISTANCE?
- WHAT ARE RISKS ASSOCIATED WITH ANTIBIOTIC USE AMONG INFANTS AND CHILDREN?
- WHAT ARE SOME POSSIBLE RISKS ASSOCIATED WITH ANTIBIOTIC USE AMONG PREGNANT WOMEN?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 6: CASE STUDIES

MODULE 6 OBJECTIVES

- INCREASE POSITIVE WAYS OF COMMUNICATING WITH PATIENTS ABOUT ANTIBIOTIC USE
- USE CASE STUDIES TO DETERMINE BEST TREATMENTS FOR SYMPTOMS AND MEANS OF COUNSELING PATIENTS

TALKING TO YOUR PATIENTS ABOUT ANTIBIOTICS

- **VALIDATE SYMPTOMS AND PROVIDE SYMPTOMATIC TREATMENT RECOMMENDATIONS:** NEVER USE THE PHRASE: "IT'S JUST A VIRUS." IT MAKES PATIENTS FEEL YOU ARE NOT UNDERSTANDING AND EMPATHIC. INSTEAD SOME STATEMENTS MIGHT INCLUDE:
  - "YOUR SYMPTOMS ARE DUE TO A VIRAL INFECTION THAT WON'T RESPOND TO ANTIBIOTICS"
  - "VIRAL INFECTIONS ARE OFTEN AS PAINFUL AS BACTERIAL INFECTIONS. I WOULD LIKE TO PROVIDE YOU WITH TREATMENT RECOMMENDATIONS THAT CAN HELP YOU FEEL BETTER".
- **TAKE YOUR TIME:** SAYING SOMETHING LIKE: "I'M IN NO HURRY, LET'S TALK MORE ABOUT HOW WE CAN MAKE YOU FEEL BETTER." TAKING A BIT MORE TIME TO EDUCATE THE PATIENT ON ANTIBIOTIC STEWARDSHIP MAY IMPROVE CLIENT SATISFACTION.

TALKING TO YOUR CLIENTS ABOUT ANTIBIOTICS

- **POINT TO A "HIGHER POWER" AND/OR RECOMMEND THEY GO TO A CLINIC WHERE THEY CAN HAVE A LABORATORY TEST FOR A DEFINITIVE DIAGNOSIS:** SOME PATIENTS MAY RESPOND TO INFORMATION THAT SUGGESTS THAT LARGER ORGANIZATIONS (MOH OR DDA) SUPPORT AMR STEWARDSHIP.
  - "ANTIBIOTIC RESISTANCE IS A SERIOUS HEALTH CONCERN IN NEPAL. MANY NATIONAL AND INTERNATIONAL HEALTH ORGANIZATIONS RECOMMEND THAT ANTIBIOTICS ONLY BE GIVEN WITH A PHYSICIAN PRESCRIPTION. AND/OR WITH LABORATORY TESTS"
- **EXPRESS CONCERN, EVEN WHEN A PATIENT IS UPSET:** LISTEN TO YOUR PATIENTS'S CONCERNS AND ADDRESS THOSE SPECIFIC CONCERNS. THINK ABOUT HOW YOU WOULD WANT SOMEONE TO TALK TO YOU OR YOUR FAMILY MEMBER WHEN SOMEONE IS SICK.
- **BE SUPPORTIVE AND RECOMMEND NEXT STEPS:** REMINDING A PATIENT THAT YOU WANT TO DO WHAT IS BEST FORM THEM AND GIVE THEM A BACK UP PLAN.
  - I KNOW YOU ARE CONCERNED ABOUT HOW YOU ARE FEELING. I SUGGEST THAT YOU TRY THE MEDICATIONS I GIVE YOU AND IF YOU DON'T FEEL BETTER IN A FEW DAYS, COME BACK TO SEE ME OR GO TO A CLINIC/HOSPITAL WITH A LABORATORY."

PATIENT CASE 1

52-year-old man

The patient enters comes into the clinic and complains of a sore throat and a cough which he says he has had for the past 4 or 5 days. He requests antibiotics. He has not tried any other treatment or therapy for his symptoms.

On examination, he does not have a fever. His throat is red but there is no evidence of swollen glands or white spots on his tonsils. The cough does not produce mucus.

Question 1. Based on the patient's presentation, what is the likely cause of his condition?

Question 2. What treatment recommendations can you provide at this time?

Question 3. Given your recommendations, what education/monitoring plan do you have for this patient particularly in regards to his request for antibiotics?

PATIENT CASE 2

27-year-old mother presents with 5-year-old daughter

The child presents with stuffy nose, cough, and headache. The mother says the child has had the stuffy nose for about 5 days but in the last 2 days started coughing. The mother is concerned that her child has an infection and needs antibiotics. The child has a temperature of 37.7. On examination, her lungs sound congested and there is slight wheezing. She does not seem to be in acute distress upon your review.

Question 1. Based on the patient's presentation, what is the likely cause of the child's condition?

_____

_____

_____

_____

Question 2. What treatment recommendations can you provide at this time?

_____

_____

_____

_____

Question 3. Given your recommendations, what education/monitoring plan do you have for this patient particularly in regards to the request for antibiotics?

_____

_____

_____

_____

PATIENT CASE 3

30-year-old pregnant woman

The woman is 7 months pregnant. She comes in complaining of urinary discomfort including increased frequency of urination over the past 2 days. She is a regular patient at the clinic and has been coming in as scheduled for her pre-natal visits. She reports no severe abdominal pain. On taking her temperature, she does not have a fever.

Question 1. Based on the patient's presentation, what is the likely cause of her condition?

Question 2. What treatment recommendations can you provide at this time?

Question 3. Given your recommendations, what education/monitoring plan do you have for this patient?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 7: INFECTION PREVENTION AND CONTROL

MODULE 7 OBJECTIVES

- UNDERSTANDING WHAT INFECTION PREVENTION AND CONTROL ENTAILS AND WHY IT IS IMPORTANT
- INCREASE KNOWLEDGE ABOUT HOW TO IMPLEMENT IPC IN YOUR WORK PLACE
- UNDERSTAND THE IMPORTANCE OF HAND HYGIENE
- INCREASE KNOWLEDGE OF RISKS OF ENVIRONMENTAL CONTAMINATION AND HOW TO ADDRESS THOSE RISKS
- INCREASE KNOWLEDGE ABOUT WASTE MANAGEMENT

INFECTION PREVENTION AND CONTROL (IPC)

- "IPC IS UNIQUE IN THE FIELD OF PATIENT SAFETY AND QUALITY OF CARE, AS IT IS UNIVERSALLY RELEVANT TO EVERY HEALTH WORKER AND PATIENT, AT EVERY HEALTH CARE INTERACTION. DEFECTIVE IPC CAUSES HARM AND CAN KILL. WITHOUT EFFECTIVE IPC IT IS IMPOSSIBLE TO ACHIEVE QUALITY HEALTH CARE DELIVERY". (WORLD HEALTH ORGANIZATION. HTTPS://WWW.WHO.INT/HEALTH-TOPICS/INFECTION-PREVENTION-AND-CONTROL#TAB=TAB_1)

WHAT IS INFECTION PREVENTION AND CONTROL (IPC)?

INFECTION PREVENTION AND CONTROL (IPC) IS A SCIENTIFIC APPROACH AND PRACTICAL SOLUTION DESIGNED TO PREVENT HARM CAUSED BY INFECTIONS IN HEALTHCARE FACILITIES AND COMMUNITIES

WHY IS IPC IMPORTANT?

- ANTIBIOTIC RESISTANCE IS INCREASING
- MULTI-DRUG RESISTANT ORGANISMS CAN BE SPREAD IN HEALTH CARE FACILITIES AND CAUSE ILLNESS IN STAFF AND PATIENTS
- DATA IN NEPAL SUGGESTS THAT MULTI-DRUG RESISTANT INFECTIONS ARE BOTH HOSPITAL- AND COMMUNITY-ACQUIRED
- IT IS IMPORTANT TO HAVE MEASURES IN PLACE TO STOP THE SPREAD OF INFECTION IN BOTH HOSPITALS AND COMMUNITY-BASED HEALTH FACILITIES.

INFECTION PREVENTION STRUCTURE

KEY COMPONENTS

- **PRACTICING** GOOD IPC IN THE HOSPITALS AND COMMUNITY CLINICS
- **SUPPORT** FROM THE HOSPITAL/CLINIC LEADERSHIP AND ALL FACILITY STAFF
- **EDUCATION** FOR ALL FACILITY STAFF
- **OUTREACH** TO DECREASE INFECTION RISKS IN THE COMMUNITY.

INFECTION PREVENTION STRUCTURE

PRACTICING IPC

- IDENTIFY STRATEGIES TO PREVENT INFECTIONS
- MAKE RECOMMENDATIONS FOR NEW PROCEDURES
- IMPLEMENT NEW PROCEDURES

SUPPORTING IPC AND EDUCATION

- IDENTIFY STRATEGIES TO COMMUNICATE ABOUT IPC TO OTHERS IN THE WORKPLACE
- PROVIDE OPPORTUNITIES FOR EVERYONE TO LEARN ABOUT IPC
- ADDRESS NEW IPC ISSUES AS THEY ARISE

INFECTION PREVENTION STRUCTURE

IPC AND AMS OUTREACH

- INFORMATIONAL POSTERS FOR BOTH IPC AND AMS IN SPACES USED BY PATIENTS AND OTHER COMMUNITY MEMBERS
- CONVERSATIONS WITH PATIENTS ABOUT IPC (E.G., WEARING MASKS, SANITIZING/HAND WASHING) AND AMS (E.G., NOT USING ANTIBIOTICS FOR VIRAL INFECTIONS, SUGGESTING USE OF OTHER MEDICATIONS (E.G., FEVER REDUCING OTCS)
- CONVERSATIONS WITH PEERS (OTHER HEALTH CARE PROVIDERS) TO SUPPORT LARGER IPC AND AMS OUTREACH IN YOUR COMMUNITY

HAND HYGIENE IN HEALTHCARE FACILITIES

- GOOD HAND HYGIENE IS VITAL IN PREVENTING INFECTIONS ACQUIRED IN HEALTH CARE, THE SPREAD OF ANTIMICROBIAL RESISTANCE AND OTHER EMERGING HEALTH THREATS.
- INFECTION ACQUIRED DURING HEALTH CARE DELIVERY IS A MAJOR GLOBAL HEALTH PROBLEM.
- 15% PATIENTS IN LOW- AND MIDDLE-INCOME COUNTRIES ARE LIKELY TO EXPERIENCE HCAI
- THE RISK IN INTENSIVE CARE UNITS (ICU), ESPECIALLY AMONG NEWBORNS, IS BETWEEN 2 AND 20 TIMES HIGHER.
- ONE REASON FOR THIS IS THAT IN SOME LOW-INCOME COUNTRIES ONLY 1 IN 10 HEALTH WORKERS PRACTICES PROPER HAND HYGIENE WHILE CARING FOR PATIENTS AT HIGH RISK OF HEALTH CARE-ASSOCIATED INFECTIONS IN ICU - OFTEN BECAUSE THEY SIMPLY DO NOT HAVE THE FACILITIES TO DO SO.

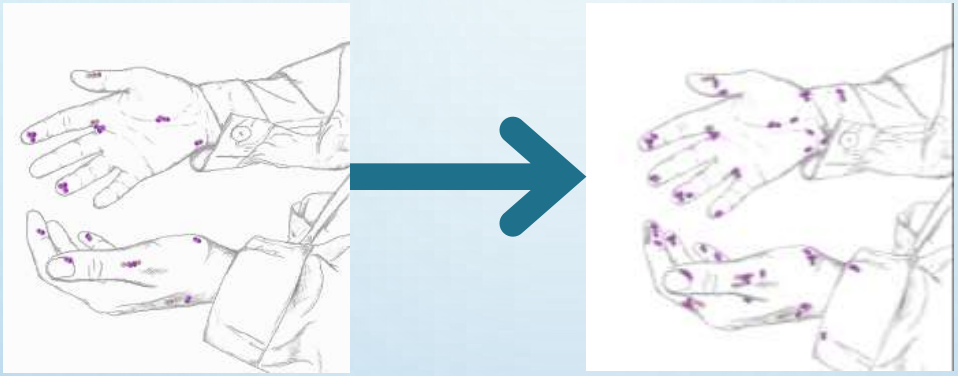
WHO 2020. https://www.who.int/news/item/05-05-2021-who-calls-for-better-hand-hygiene-and-other-infection-control-practices

HAND HYGIENE IN THE COMMUNITY

- ABOUT 1.8 MILLION CHILDREN UNDER THE AGE OF 5 DIE EACH YEAR FROM DIARRHEAL DISEASES AND PNEUMONIA, THE TOP TWO KILLERS OF YOUNG CHILDREN AROUND THE WORLD [8].
- HANDWASHING IN THE COMMUNITY WITH SOAP COULD PROTECT **ABOUT 1 OUT OF EVERY 3 YOUNG CHILDREN WHO GET SICK WITH DIARRHEA [2, 3] AND ALMOST 1 OUT OF 5 YOUNG CHILDREN WITH RESPIRATORY INFECTIONS LIKE PNEUMONIA [3, 5].**

US Center for Disease Control. Available at https://www.cdc.gov/handwashing/why-handwashing.html

THE POWER TO CONTROL INFECTION IS IN OUR HANDS



GERMS SURVIVE ON HANDS THAT ARE NOT PROPERLY WASHED AND THEN

THE POWER TO CONTROL INFECTION IS IN OUR HANDS

HOW GERMS ARE SPREAD THROUGH OUR HANDS

- Touching your eyes, nose, and mouth with unwashed hands
- Prepare or eat food and drinks with unwashed hands
- Touch a contaminated surface or objects
- Blowing your nose, coughing, or sneezing into hands and then touch other people's hands or common objects

HAND HYGIENE

- HAND RUB BY HAND SANITIZER

- HAND WASH BY SOAP AND WATER

How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: 20-30 seconds

1a 1b

Apply a palmful of the product in a cupped hand, covering all surfaces;

2

Rub hands palm to palm;

3

Right palm over left dorsum with interlaced fingers and vice versa;

4

Palm to palm with fingers interlaced;

5

Backs of fingers to opposing palms with fingers interlocked;

6

Rotational rubbing of left thumb clasped in right palm and vice versa;

7

Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8

Once dry, your hands are safe.

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES Clean Your Hands

HAND HYGIENE WITH SOAP & WATER

- CLICK THE VIDEO: WHO HAND WASHING TECHNIQUE

HTTPS://WWW.YOUTUBE.COM/WATCH?V=3PMVJQUCM4E

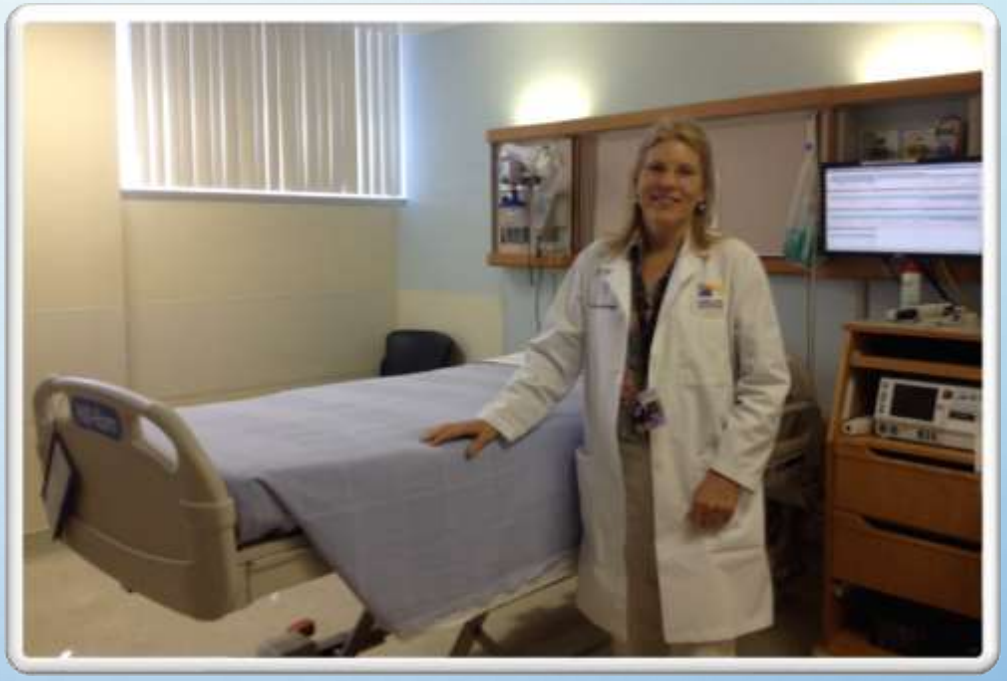
NURSING AND MIDWIFE AMS AND IPC TRAINING

WHEN TO SANITIZE OR WASH HANDS

- **Before, during,** and **after** preparing food
- **Before** and **after** eating food
- **Before** and **after** caring for someone who is sick
- **Before** and **after** treating a cut or wound
- **Before** dispensing medications to clients
- **Before** any direct interactions with a client/patient
- **After** using the toilet
- **After** blowing your nose, coughing, or sneezing
- **After** touching an animal, animal feed, or animal waste
- **After** touching garbage

WHEN TO SANITIZE OR WASH HANDS

- **HAND HYGIENE MUST BE DONE AT THE "POINT-OF-CARE"**



PPE FOR STANDARD PRECAUTIONS

- Gloves
- Gowns
- Mask and
- Goggles or a face shield

PPE FOR EXPANDED PRECAUTIONS

- **Contact Precautions:** Gown and gloves
- **Modified Contact Precautions**
- **Droplet Precautions:** Surgical masks within 1 meter of patient;
- **Airborne Precautions:** Use of a particulate respirator.

ENVIRONMENTAL CONTAMINATION

- ‘HIGH TOUCH’ SURFACE OR FREQUENTLY TOUCH SURFACE AREA

Pathogens in Hospital Settings

- BEDRAILS 85%
- BP CUFFS 83%
- TV REMOTES 85%
- BEDSIDE TABLES 93%
- MONITORS, IV PUMPS 58%
- TOILET SEATS 93%
- DOOR HANDLES 59%

Boyce et al ICHE 2007;Carling et al ICHE 2008

Bacteria can survive on surfaces for months,

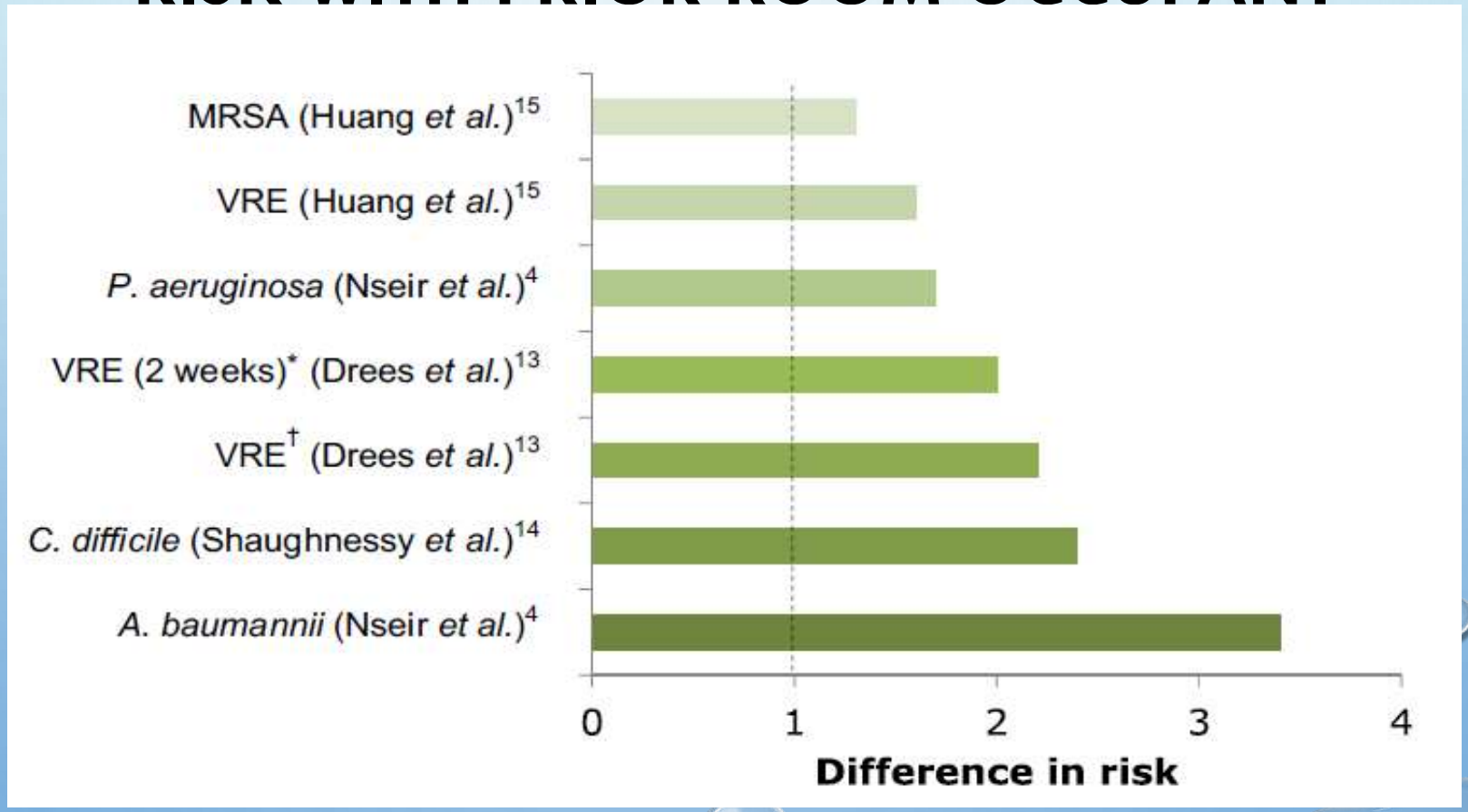
ENVIRONMENTAL CONTAMINATION

- DRY SWEEPING USED OFTEN IN NEPAL CAN RE-AEROSOLIZE INFECTIOUS PARTICLES, SO CONSIDER USING OTHER CLEANING TECHNIQUES, SUCH AS:
  - CLEAN HIGH-TOUCH SURFACES AT LEAST ONCE A DAY OR AS OFTEN AS DETERMINED IS NECESSARY.
  - WASH HANDS WITH SOAP AND WATER AFTER CLEANING
  - BLEACH PRODUCTS CAN BE USED FOR DISINFECTING SURFACES.
  - IF THERE HAS BEEN A SICK PERSON IN YOUR FACILITY WITHIN THE LAST 24 HOURS, YOU SHOULD CLEAN AND DISINFECT THE SPACES THEY OCCUPIED.

CLEANING AND DISINFECTION

- SUSCEPTIBLE TO SOAP AND MOST NORMAL DISINFECTANTS.
- WHO RECOMMENDS: LOG3 REDUCTION
- 70-90% ETHYL ALCOHOL: DISINFECT REUSABLE DEDICATED EQUIPMENT: THERMOMETER, STETHOSCOPE
- SODIUM HYPOCHLORITE AT 0.1% FOR DISINFECTION OF GENERAL ENVIRONMENT DISINFECTION TOUCH SURFACES
- HYDROGEN PEROXIDE >=0.5%

ENVIRONMENTAL CONTAMINATION LINKED TO HCAI RISK WITH PRIOR ROOM OCCUPANT



Otter et al. ICHE 2013;41:S6-S11

HEALTH CARE WASTE MANAGEMENT

INTRODUCTION

- EVIDENCE SUGGESTS THAT A MAJORITY OF MULTI-DRUG RESISTANT (MDR) PATHOGENS ARE IN THE ENVIRONMENTS AND THESE INFECTIONS ARE OFTEN COMMUNITY ACQUIRED;
- THE WASTE GENERATED BY HEALTH CARE INSTITUTIONS, RESEARCH FACILITIES AND LABORATORIES DURING, DIAGNOSIS, TREATMENT, IMMUNIZATION OF HUMAN BEINGS OR ANIMALS AND RESEARCH ACTIVITIES / BIOLOGICAL TEST
- APPROPRIATE WASTE MANAGEMENT PLAYS A KEY ROLE IN MITIGATING FURTHER SPREAD OF INFECTION, ESPECIALLY IN DEVELOPING COUNTRIES THAT HAVE POOR WASTE MANAGEMENT STRATEGIES.

BENEFITS OF HCWM

- PREVENTION AND REDUCTION IN THE INCIDENCE OF HOSPITAL ACQUIRED AND GENERAL INFECTIONS SPECIFICALLY CORONA VIRUS DISEASE.
- REDUCTION IN THE POSSIBILITY OF DISEASE AND DEATH DUE TO REUSE AND REPACKAGING OF INFECTIOUS DISPOSABLES.
- REDUCTION IN THE COST OF INFECTION CONTROL WITHIN THE HOSPITAL.
- GENERATION OF REVENUE THROUGH APPROPRIATE TREATMENT AND DISPOSAL OF THE WASTE.
- IMPROVE IMAGE OF THE HEALTH CARE INSTITUTIONS AND INCREASES THE QUALITY OF LIFE.
- CLEANER AND HEALTHIER ENVIRONMENT/SURROUNDING

WASTE GENERATION IN HOSPITAL

- BIO-MEDICAL WASTE GENERATION IN HIGH-INCOME ASIAN COUNTRIES VARIES FROM 2.5 TO 4 KG/BED/DAY
- IT IS 1.8 TO 2.2 KG/BED/DAY IN LOW-INCOME COUNTRIES.
- ESTIMATED 16 BILLION INJECTIONS
- HARMFUL MICROORGANISMS IN HOSPITAL WASTE INFECT PATIENTS, HEALTH WORKERS AND THE GENERAL PUBLIC.
- HEPATITIS B VIRUS, HEPATITIS C VIRUS, HUMAN IMMUNODEFICIENCY VIRUS AND COVID -19 VIRUSES ARE THE COMMONLY TRANSMITTED INFECTIONS TO THE HEALTH CARE WORKERS.

CATEGORIES OF HEALTH CARE WASTE

GENERAL WASTE

BIODEGRADABLE WASTE

NON-BIODEGRADABLE WASTE

RISK WASTE

- INFECTIOUS WASTE

- SHARP WASTE

RISK WASTE

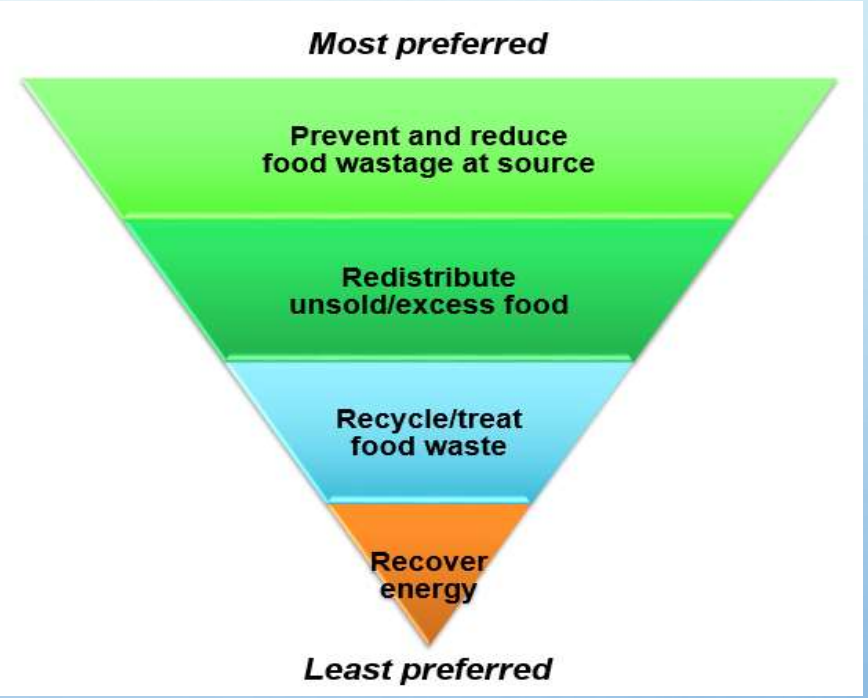
- PATHOLOGICAL WASTE

- PHARMACOLOGICAL WASTE

STEPS OF WASTE MANAGEMENT

WASTE MINIMIZATION

- 3 R- REDUCE
  REUSE
  RECYCLE



WASTE SEGREGATION AND COLLECTION

- USE SEPARATE COLOR-CODED CONTAINER/BINS TO DISCARD GENERATED WASTE.
- USE DOUBLE LAYERED WASTE BAGS
- WASTE COLLECTION AND LABELING
- SEAL THE BAG BEFORE TRANSPORTING WASTE

COLOR CODING BUCKETS ACCORDING TO NEPAL GOVERNMENT

- NON RISK BIODEGRADABLE WASTE: GREEN
- NON RISK RECYCLABLE: DARK BLUE
- NON BIODEGRADABLE AND NON RECYCLABLE: LIGHT BLUE
- PATHOLOGICAL, PHARMACEUTICAL, CYTOTOXIC WASTE: RED
- SHARPS: RED PUNCTURE PROOF BOX
- INFECTIOUS WASTE: BROWN
- HEAVY METAL: YELLOW
- RADIOACTIVE : BLACK

WASTE TRANSPORTATION

- PLACE THE WASTE BAG IN CLOSE TROLLEY WHILE TRANSPORTING TO TREATMENT ZONE OR TEMPORARY STORAGE POINT.
- SEPARATE PATHWAY FOR TRANSPORTING WASTE
- DO NOT USE INFECTIOUS WASTE CARTS FOR REGULAR GARBAGE
- DISINFECT THE TROLLEY AND WASTE CONTAINERS WITH 1% HYPOCHLORITE SOLUTION DAILY AND AFTER EACH USE.
- INNER AND OUTER SURFACE OF CONTAINERS/BINS/TROLLEYS – DISINFECT 1% SODIUM HYPOCHLORITE

WASTE HANDLERS' UTILITIES

- MASK PREFERABLY N95
- FACE SHIELD/GOGGLES'
- HEAVY DUTY GLOVES
- CAP
- BOOT
- APRON

WASTE STORAGE

STORAGE WASTE SHOULD

- NOT BE STORED MORE THAN 24 HOURS IN TEMPORARY STORAGE AREA.
- BE INACCESSIBLE TO ANIMALS, BIRDS, RODENTS AND UNAUTHORIZED PEOPLE
- EASY ACCESS FOR WASTE COLLECTION VEHICLE.
- PROTECTION FROM SUN, RAIN, STRONG WINDS AND FLOODS.

WASTE TREATMENT

- TREAT THE WASTE WITH AUTOCLAVE, FRICTION HEAT SYSTEM OR ANY OTHER WASTE TREATMENT TECHNOLOGY
- IF TREATMENT ZONE IS NOT AVAILABLE WITHIN HEALTHCARE FACILITY COORDINATE WITH WASTE TREATMENT PROVIDER
- WASTE DISPOSAL: DISCARD TREATED WASTE AS REGULAR WASTE.
- SAFELY REMOVE PPE AND DISPOSE IF IT IS NON-REUSABLE AND DISINFECT IF IT IS REUSABLE
- STRENGTHEN TRACKING, AVOID MORE INCINERATION
- RECYCLING SHOULD CONTINUE AS NORMAL

KEY MESSAGES

- HCWM: DUTY OF ALL STAKEHOLDERS
- HCWM WITH SOCIAL DISTANCING, HAND HYGIENE, PPE, RESPIRATORY ETIQUETTE
- FOLLOW NATIONAL RULES AND INTERNATIONAL GUIDANCE CDC/WHO
- DECREASING INCINERATION CATEGORY WASTE
- FOLLOW BAT, BAP, SUSTAINABLE, ECOFRIENDLY TECHNOLOGY
- PPE: ALL SANITATION WORKERS IN COVID WARD, LABS, ICU
- HCWM: ESSENTIAL HEALTH SERVICE
- PUBLIC HEALTH CONCERN

DISCUSSION QUESTIONS

- WHAT ARE SOME TYPES OF RISKY HEALTHCARE WASTE? WHAT ARE SOME TYPES OF NON-RISKY HEALTHCARE WASTE?
- WHAT ARE THE BENEFITS OF HEALTHCARE WASTE MANAGEMENT?
- WHAT ARE KEY STEPS IN USING 'WASTE SEGREGATION' TO MANAGE HEALTHCARE WASTE?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 8: COMMUNITY EDUCATION AND OUTREACH

MODULE 8 OBJECTIVES

- INCREASE UNDERSTANDING OF THE IMPORTANCE OF PEER-TO-PEER SUPPORT TO DECREASE AMR AND INCREASE IPC;
- TO INCREASE KNOWLEDGE ABOUT HOW TO TALK TO PATIENTS ABOUT ANTIBIOTICS AND AMR;
- INCREASE UNDERSTANDING OF THE ROLE OF NURSES IN ADVOCATING STEWARDSHIP AND INFECTION PREVENTION AND CONTROL.

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP: COMMUNITY EDUCATION & OUTREACH

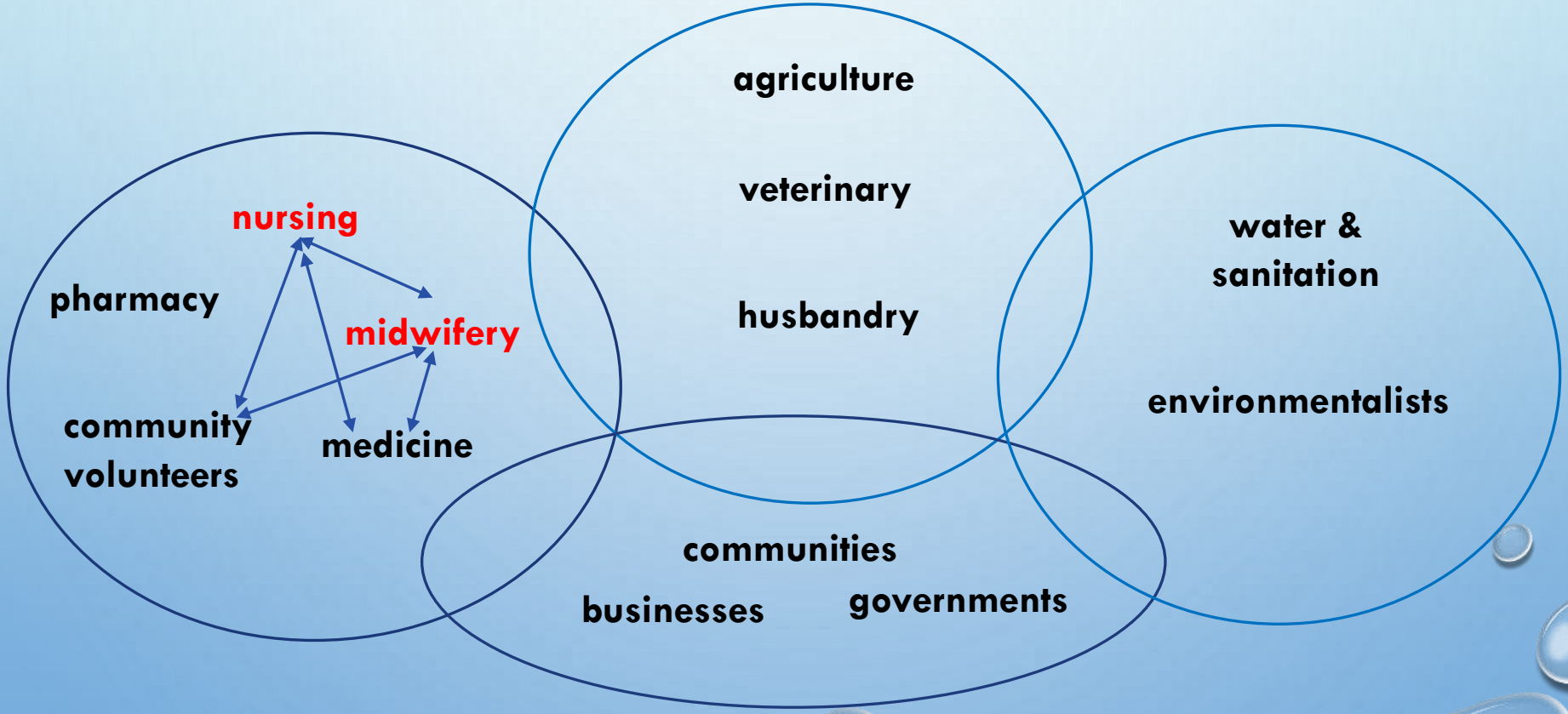
NURSES HAVE REGULAR CONTACT WITH PATIENTS. THIS CAN PROVIDE AN OPPORTUNITY TO INFORM PATIENTS AND THE COMMUNITY ABOUT RISKS ASSOCIATED WITH AMR AND SPREAD OF INFECTIONS AND WAYS TO DECREASE THESE RISKS.

AS A HEALTH CARE PROVIDER

- UNDERSTAND THE IMPORTANCE OF **LEARNING AND DEVELOPMENT** AS PART OF PERSONAL AND TEAM DEVELOPMENT.
- BELIEVE THAT EVERY INDIVIDUAL HAS THE CAPACITY TO LEAD BY EXAMPLE WITHIN THEIR PEER GROUP.
  - BE A ROLE MODEL FOR STUDENTS, COLLEAGUES AND PEERS.
  - BE AWARE OF ONE'S OWN AND OTHERS' LIMITATION AND ENCOURAGE WILLINGNESS TO ASK FOR ADVICE. SHOW ENTHUSIASM FOR LEARNING AND FOR TRAINING OTHERS.
  - PROVIDE INFORMATION TO PATIENTS TO SUPPORT STEWARDSHIP.

World Health Organization. 2019. HEALTH WORKERS' EDUCATION AND TRAINING ON ANTIMICROBIAL RESISTANCE. Geneva.

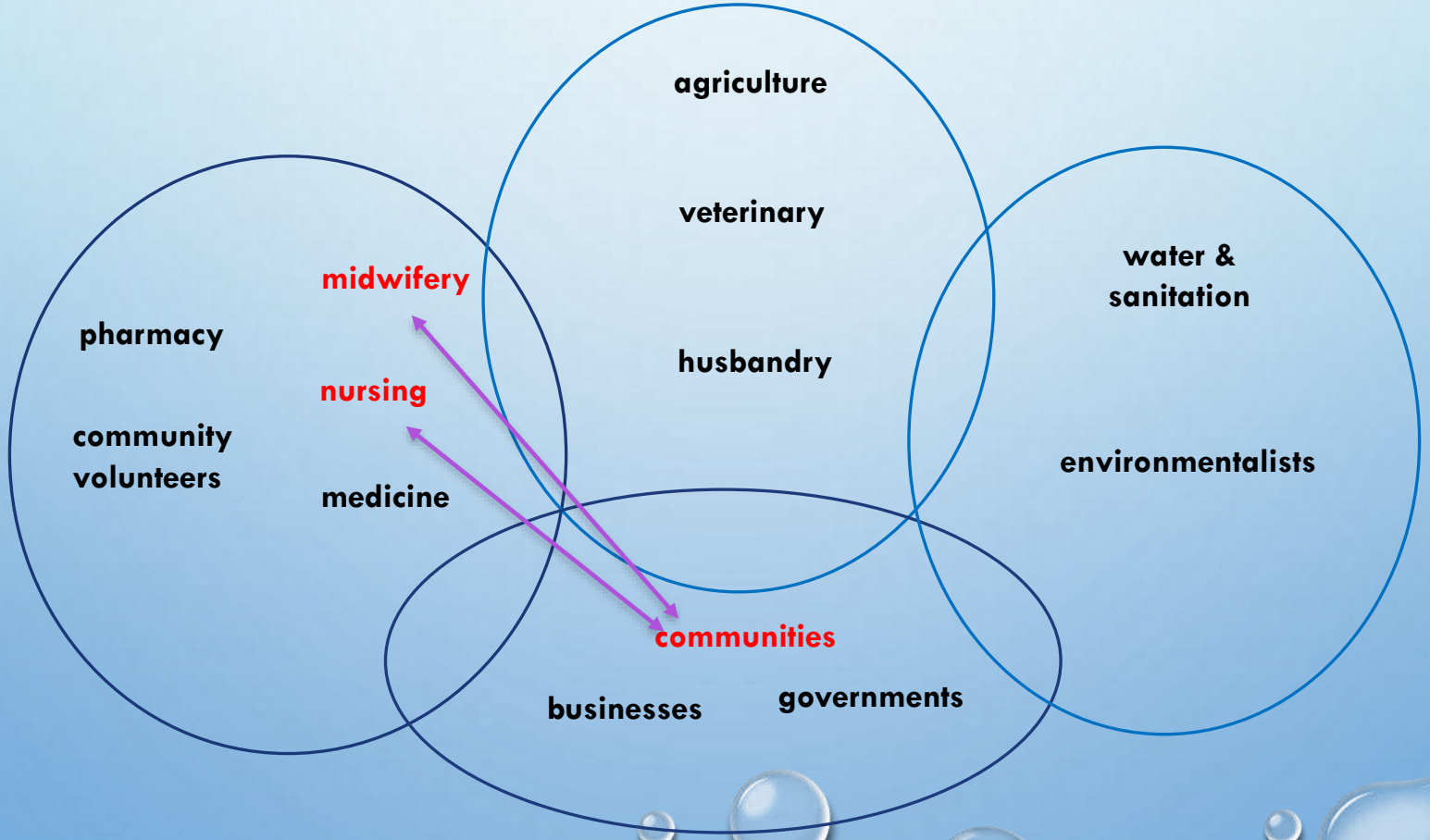
PEER-TO-PEER OUTREACH AND COMMUNICATION



IN-SERVICE TRAININGS AND EDUCATION

- STAFF TRAINING IN AMR, STEWARDSHIP AND IPC
  - PROVIDE WRITTEN INFORMATION OR LINKS TO ON-LINE RESOURCES;
  - BY EXAMPLE – CLINIC/WARD MANAGERS AND STAFF SHOULD SET AN EXAMPLE FOR ONE ANOTHER;
  - DURING CONSULTATION – SHARING EXPERIENCES IN RELATION TO DECISION-MAKING ABOUT DISPENSING OTCS, ANTIBIOTICS;
  - READILY AVAILABLE GUIDELINES, E.G., POSTERS, PAMPHLETS;

COMMUNITY OUTREACH AND EDUCATION



COMMUNITY OUTREACH AND EDUCATION

- THERE ARE MANY WAYS YOU CAN COMMUNICATE WITH YOUR PATIENTS AND YOUR COMMUNITY ABOUT ANTIBIOTICS
  - WHEN SOMEONE HAS A PRESCRIPTION FOR ANTIBIOTICS MAKE SURE THEY UNDERSTAND THE NEED TO TAKE THE MEDICATION AS PRESCRIBED, ARE AWARE OF SIDE EFFECT/ALLERGIC REACTIONS, AND ANY INFORMATION REGARDING RESTRICTIONS ON FOODS, ETC., WHILE TAKING THE MEDICATION.
  - DISPLAY POSTERS ABOUT ANTIBIOTIC RESISTANCE AND STEWARDSHIP WITHIN AREAS COMMON TO PATIENT CARE AND THE COMMUNITY.
  - USE THE PREVIOUSLY SUGGESTED STRATEGIES TO TALK TO PATIENTS WHO REQUEST ANTIBIOTICS.
  - HAVE AVAILABLE BRIEF WRITTEN/ILLUSTRATED INFORMATION ABOUT ANTIBIOTIC USE AND RESISTANCE FOR PATIENTS WHO REQUEST ANTIBIOTICS.
  - PARTICIPATE IN ANTIMICROBIAL RESISTANCE AND STEWARDSHIP AWARENESS WEEK.

COMMUNITY OUTREACH AND EDUCATION

- MESSAGES FOR PATIENTS AND THE COMMUNITY
  - **ANTIBIOTICS CAN SAVE LIVES.** WHEN A PATIENT NEEDS ANTIBIOTICS, THE BENEFITS OUTWEIGH THE RISKS OF SIDE EFFECTS AND ANTIBIOTIC RESISTANCE.
  - **ANTIBIOTICS AREN'T ALWAYS THE ANSWER.** EVERYONE CAN HELP IMPROVE ANTIBIOTIC PRESCRIBING AND USE. THE WAY WE TAKE ANTIBIOTICS, HELPS KEEP US HEALTHY NOW, HELPS FIGHT ANTIBIOTIC RESISTANCE, AND ENSURES THAT THESE LIFE-SAVING ANTIBIOTICS WILL BE AVAILABLE FOR FUTURE GENERATIONS.
  - **ANTIBIOTICS DO NOT WORK ON VIRUSES,** SUCH AS THOSE THAT CAUSE COLDS, FLU, BRONCHITIS, OR RUNNY NOSES.

COMMUNITY OUTREACH AND EDUCATION

- MESSAGES FOR CONSUMERS
  - **ANTIBIOTICS ARE ONLY NEEDED FOR TREATING CERTAIN INFECTIONS CAUSED BY BACTERIA, BUT EVEN SOME BACTERIAL INFECTIONS GET BETTER WITHOUT ANTIBIOTICS.** ANTIBIOTICS AREN'T NEEDED FOR MANY SINUS INFECTIONS AND SOME EAR INFECTIONS. ANTIFUNGAL DRUGS TREAT FUNGAL INFECTIONS.
  - **AN ANTIBIOTIC WILL NOT MAKE YOU FEEL BETTER IF YOU HAVE A VIRUS.** RESPIRATORY VIRUSES USUALLY GO AWAY IN A WEEK OR TWO WITHOUT TREATMENT. ASK YOUR HEALTHCARE PROFESSIONAL ABOUT THE BEST WAY TO FEEL BETTER WHILE YOUR BODY FIGHTS OFF THE VIRUS.

COMMUNITY OUTREACH AND EDUCATION

- MESSAGES FOR PATIENTS AND THE COMMUNITY
  - **WHEN ANTIBIOTICS AREN'T NEEDED, THEY WON'T HELP YOU, AND THE SIDE EFFECTS COULD STILL CAUSE HARM.** SIDE EFFECTS RANGE FROM MINOR TO VERY SEVERE HEALTH PROBLEMS.
  - **TAKING ANTIBIOTICS CAN CONTRIBUTE TO THE DEVELOPMENT OF ANTIBIOTIC RESISTANCE.** ANTIBIOTIC RESISTANCE OCCURS WHEN GERMS LIKE BACTERIA AND FUNGI DEVELOP THE ABILITY TO DEFEAT THE DRUGS DESIGNED TO KILL THEM. IF ANTIBIOTICS LOSE THEIR EFFECTIVENESS, THEN WE LOSE THE ABILITY TO TREAT INFECTIONS.
  - **IF YOU NEED ANTIBIOTICS, TAKE THEM EXACTLY AS PRESCRIBED.** TALK WITH YOUR HEALTHCARE PROFESSIONAL IF YOU HAVE ANY QUESTIONS ABOUT YOUR ANTIBIOTICS.

COMMUNITY OUTREACH AND EDUCATION

- MESSAGES FOR PATIENTS AND THE COMMUNITY
  - **DO YOUR BEST TO STAY HEALTHY AND KEEP OTHERS HEALTHY** BY CLEANING HANDS BY WASHING WITH SOAP AND WATER FOR AT LEAST 20 SECONDS OR USING A HAND SANITIZER THAT CONTAINS AT LEAST 60% ALCOHOL; COVERING YOUR MOUTH AND NOSE WITH A TISSUE WHEN YOU COUGH OR SNEEZE; STAYING HOME WHEN SICK; AND GETTING RECOMMENDED VACCINES, SUCH AS THE FLU VACCINE

DISCUSSION QUESTIONS

- WHAT ARE SOME OPPORTUNITIES FOR NURSES/MIDWIVES TO EDUCATE PATIENTS AND THEIR COMMUNITIES ABOUT AMR AND STEWARDSHIP?
- WHAT ARE IMPORTANT MESSAGES TO PROVIDE TO PATIENTS AND THE COMMUNITY ABOUT ANTIBIOTICS, ANTIBIOTIC USE, AND INFECTION PREVENTION AND CONTROL?

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 9: PROGRAM SUMMARY AND OVERVIEW

KEY MESSAGES

- NURSES AND MIDWIVES ARE ESSENTIAL TO THE HEALTH AND WELL-BEING OF COMMUNITIES THROUGHOUT NEPAL. THEREFORE, THEY ARE WELL-PLACED TO SUPPORT STEWARDSHIP WITHIN THEIR PRACTICE AND IN THEIR COMMUNITIES.
  - PROVIDING HOSPITAL AND PRIMARY HEALTH CARE
  - SPECIMEN COLLECTION: APPROPRIATE TECHNIQUE
  - EARLY DETECTION OF SIGNS AND SYMPTOMS
  - SUPPORTING IMMUNIZATION PROGRAMS
  - HAND HYGIENE
  - ENVIRONMENTAL HYGIENE
  - PARTICIPATING IN AMS AND IPC TEAMS/COMMITTEES TO SUPPORT STEWARDSHIP AND GOOD PRACTICES TO CONTROL SPREAD OF INFECTIONS;
  - MONITORING PATIENTS ON ANTIBIOTICS
  - DISCUSSING DISCHARGE PLANS, PROPER USE OF PRESCRIBED ANTIBIOTICS AND OTHER MEDICATIONS, INFORMATION ON POTENTIAL ADVERSE EVENTS THAT MIGHT BE ASSOCIATED WITH PRESCRIBED ANTIBIOTICS
  - PATIENT EDUCATION

KEY MESSAGES

- **ANTIMICROBIAL RESISTANCE IS THE ABILITY OF A MICROORGANISM (BACTERIA, VIRUSES, AND SOME PARASITES) TO STOP AN ANTIMICROBIAL (ANTIBIOTICS, ANTIVIRALS AND ANTIMALARIALS) FROM WORKING AGAINST IT. AS A RESULT, STANDARD TREATMENTS BECOME INEFFECTIVE, INFECTIONS PERSIST AND MAY SPREAD TO OTHERS**
- **MULTIDRUG RESISTANCE IS A CONDITION ENABLING A DISEASE CAUSING ORGANISM TO RESIST DISTINCT DRUG AND CHEMICALS OF A WIDE VARIETY OF STRUCTURE AND FUNCTION TARGETED TO ERADICATE THE ORGANISM**
- **RESISTANCE CAN BE ACQUIRED WHEN ONE TYPE OF BACTERIA PASSES DNA TO ANOTHER TYPE OF BACTERIA**
- **ANTIMICROBIAL RESISTANCE IS A SIGNIFICANT GLOBAL HEALTH PROBLEM**
- **ANTIMICROBIAL RESISTANCE STEWARDSHIP IS EVERYONE'S RESPONSIBILITY**
- **THERE ARE SERIOUS CONSEQUENCES RELATED TO ANTIMICROBIAL RESISTANCE**
  - SERIOUS COMPLICATIONS INCLUDING DEATH FOR ELDERLY AND CHILDREN
  - INCREASED LENGTH OF THERAPY AND MORE DOCTOR VISITS
  - PROLONGED HOSPITAL STAY AND SIGNIFICANT INCREASE OF TREATMENT COST

KEY MESSAGES

- ANTIBIOTICS SHOULD NEVER BE USED FOR VIRAL INFECTIONS (E.G., COLDS, INFLUENZA, COVID-19)
- WHEN ANTIBIOTICS MIGHT BE NECESSARY TO TREAT SOMEONE, THEY SHOULD BE DISPENSED WITH STRICT ADHERENCE TO GUIDELINES IN TERMS OF TYPE/CLASS, DOSAGE, AND DURATION
- ANTIBIOTICS CAN CAUSE ADVERSE EVENTS AND ALLERGIES IN CHILDREN AND ADULTS
- OPTIMIZING ANTIBIOTIC USE INCLUDES:
- ONLY USE WHEN NEEDED
- USE THE RIGHT AGENT (ANTIBIOTIC)
- AT THE RIGHT DOSE
- FOR THE RIGHT DURATION

KEY MESSAGES

- INFECTION PREVENTION AND CONTROL IS AN ESSENTIAL PART OF ANTIMICROBIAL STEWARDSHIP
- WASTE MANAGEMENT IS A KEY COMPONENT OF INFECTION PREVENTION AND CONTROL FOR HCAI AND CAN DECREASE RISK OF DISEASE AND DEATH AND REDUCE COST OF INFECTION CONTROL WITHIN HOSPITALS
- HAND WASHING AND USE OF ALCOHOL BASED CLEANERS ARE KEY ELEMENTS TO INFECTION PREVENTION AND CONTROL AND ARE SIMPLE WAYS TO HELP FIGHT ANTIMICROBIAL RESISTANCE
- BACTERIA CAN LIVE FOR A LONG PERIOD OF TIME ON SURFACES. IT IS THEREFORE IMPORTANT TO KEEP SURFACES CLEAN. BLEACH PRODUCTS CAN BE USED FOR DISINFECTING SURFACES.

KEY MESSAGES

- **NURSES AND MIDWIVES CAN BE ADVOCATES FOR SUPPORTING STEWARDSHIP IN THEIR PLACES OF WORK AND THEIR COMMUNITIES.**

- **EVERYONE HAS A PART TO PLAY IN THIS FIGHT.**

धन्यवाद

ANTIMICROBIAL RESISTANCE AND STEWARDSHIP

MODULE 10: RESOURCES

AMR RESOURCES

- REACT. POSTER/BOOKLET FORMAT INFORMATION FOR CONSUMERS (ENGLISH).

HTTPS://WWW.REACTGROUP.ORG/WP-CONTENT/UPLOADS/2016/09/FACTSHEETINDIVIDUAL.JAN2016.PDF

HTTPS://WWW.REACTGROUP.ORG/WP-CONTENT/UPLOADS/2017/04/EPN-SCHOLARY-BOOKLET-COMMUNITIES.PDF

OVERVIEW OF AMR AND STEWARDSHIP VIDEO (NEPALI)

HTTPS://WWW.YOUTUBE.COM/WATCH?V=R6_2LPWXVTU

STEWARDSHIP AND GUIDELINE RESOURCES

- GARP, NEPAL. SITUATIONAL ANALYSIS AND RECOMMENDATIONS FOR ANTIMICROBIAL RESISTANCE IN NEPAL. HTTPS://CDDEP.ORG/WP-CONTENT/UPLOADS/2017/08/GARP-NEPAL_ES.PDF

IPC RESOURCES

- WORLD HEALTH ORGANIZATION TRAINING COURSE ON INFECTION PREVENTION AND CONTROL (ENGLISH)

HTTPS://OPENWHO.ORG/COURSES/IPC-CC-MMIS-EN

- HAND WASHING TECHNIQUE (NEPALI)

HTTPS://WWW.YOUTUBE.COM/WATCH?V=EIIQDFUG3PA

- NEPAL MINISTRY OF HEALTH AND POPULATION. HAND WASHING POSTERS/BROCHURES (NEPALI)

HTTPS://WWW.MOHP.GOV.NP/ENG/MEDIA-DOCS/BROCHURE/HANDWASHING

INFECTION PREVENTION AND CONTROL VIRTUAL TRAINING PACKAGE.
HTTPS://IPC.GHELEARNING.ORG/

WHO RECOMMENDATIONS FOR PREVENTION AND TREATMENT OF MATERNAL PERIPARTUM INFECTIONS

HTTP://APPS.WHO.INT/IRIS/BITSTREAM/HANDLE/10665/186171/9789241549363_ENG.PDF;JSESSIONID=1D8BDC6FC25F157C44106FC4527FF65E?SEQUENCE=1

WHO. MAKING HEALTHCARE SAFER

HTTPS://WWW.AHRQ.GOV/SITES/DEFAULT/FILES/WYSIWYG/RESEARCH/FINDINGS/MAKING-HEALTHCARE-SAFER/MHS3/MAKING-HEALTHCARE-SAFER-III.PDF