



The Antimicrobial Resistance Challenge: No Room for Complacency

Mohan P. Joshi, MD, MSc, MBBS
Principal Technical Advisor and Lead for
Pharmaceutical Services, SIAPS, MSH

Brownbag at USAID
Crystal Drive, Arlington, VA
9 November 2017



Antimicrobial resistance (AMR)

- One of the biggest public health threats and a major global health security risk
- Affects humans, animals, agriculture, and environment



Consequences of AMR

Prolonged morbidity and mortality

Psychological and financial impacts

Overburdened health systems

Lost productivity

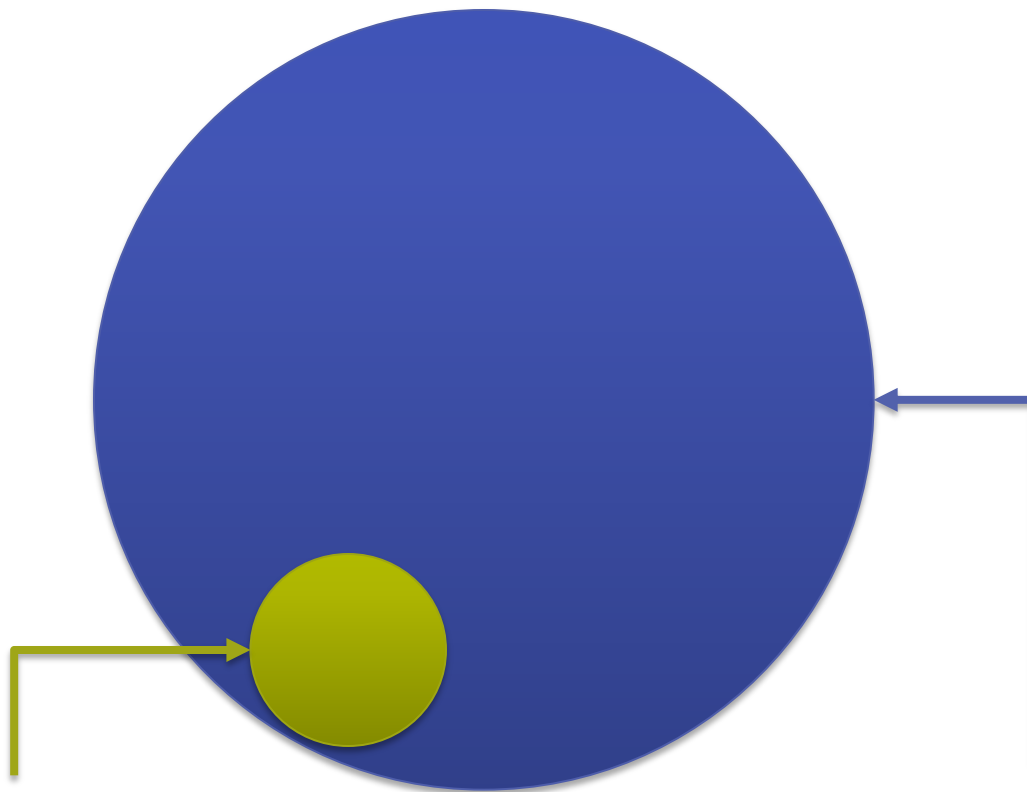
Decreased food production and unsafe foods

Potential future impacts on travel, migration, trade, and tourism



USAID
FROM THE AMERICAN PEOPLE

SIAPS 



700,000

The **current** estimated number of deaths due to AMR each year

10 million

Projected number of annual deaths due to AMR **in 2050** if left unchecked

\$100 trillion

Cumulative costs
due to AMR by
2050 if it is not
contained

Projected
decrease in
global GDP by
2050 if AMR is
left unchecked

3.8%

Sources: Review on AMR. 2016. *Tackling Drug-Resistant Infections Globally: Final Report and Recommendations*. The Review on Antimicrobial Resistance. https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf

World Bank Group. 2017. *Drug-Resistant Infections: A Threat to Our Economic Future (Final Report)*. Washington, DC: International Bank for Reconstruction and Development/The World Bank. <http://documents.worldbank.org/curated/en/323311493396993758/pdf/114679-REVISED-v2-Drug-Resistant-Infections-Final-Report.pdf>



USAID
FROM THE AMERICAN PEOPLE

SIAPS 

Examples of health system challenges contributing to AMR



Up to 50% of all antibiotic prescriptions unnecessary



Two-thirds of antibiotics sold without prescription, mostly via the unregulated private sector

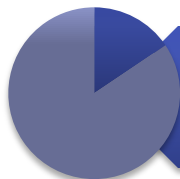


50% of patients have poor compliance

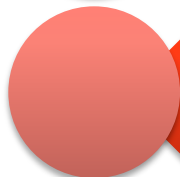


50% of populations lack access to essential antibiotics

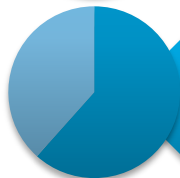
Examples of health system challenges contributing to AMR (2)



HAIs worryingly high in LMICs – prevalence 15.5%



Less than 40% of countries have put in place IPC programs for AMR containment



On average, 61% of health workers do not adhere to recommended hand hygiene practices



Most LMICs have weak lab and surveillance capacity



Poor regulatory capacity to ensure the quality and safety of antimicrobials

AMR – A challenge on the path to Sustainable Development Goals (SDGs)

AMR threatens progress on SDG 3 (health)



The issue of AMR is also linked to:

- SDG 1 (end poverty)
- SDG 2 (food security, sustainable agriculture)
- SDG 6 (water and sanitation)
- SDG 8 (sustainable economic growth)

AMR – A challenge on the path to expanded health coverage

Makes 1st- and 2nd-line antimicrobials ineffective, **impacting supply chain, access, and efficacy**

Heavily diverts scarce resources, **impacting supply chain and affordability** for health systems

Very expensive to treat, causing **affordability** issues and **financial hardship** for patients

Makes treatment difficult and complex, **impacting quality and effectiveness of services**

EXAMPLE

Treatment of MDR-TB:

- Up to 200 times more expensive
- More side effects
- Lower cure rates (<50%)
- Treatment duration 20 months or more

Sources: Joshi MP. 2016. Containing Antimicrobial Resistance to Realize the Goals of Universal Health Coverage. Plenary presented at the Ecumenical Pharmaceutical (EPN) Forum 2016. 18-20 May 2016, Tübingen, Germany.
<http://siapsprogram.org/publication/containing-antimicrobial-resistance-to-realize-the-goals-of-universal-health-coverage/>
Nugent et al. The Race Against Drug Resistance. CGD, 2010;
<https://www.whitehouse.gov/blog/2015/12/22/national-action-plan-combat-multidrug-resistant-tuberculosis>
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076529/pdf/erj-44-01-023.pdf>



USAID
FROM THE AMERICAN PEOPLE

SIAPS 

AMR: A threat to USG investments

A major threat to:

Creating an AIDS-free generation (AFG)

Ending preventable child and maternal deaths (EPCMD)

Combating other infectious disease threats (TB, malaria, others)

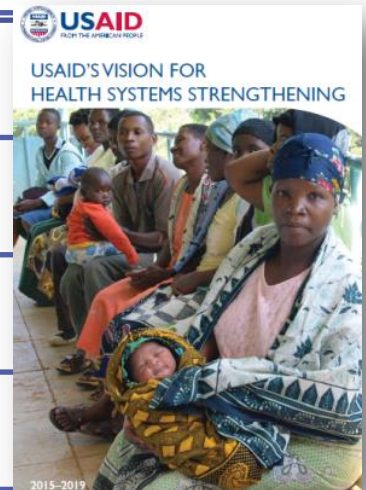
Threat to the strategic outcomes of USAID's Vision for Health Systems Strengthening 2015–2019:

Financial protection

Essential services

Population coverage

Responsiveness



Timeline of key WHO actions on AMR

Year	World Health Organization (WHO) Response to AMR
2001	WHO Global Strategy for Containment of AMR
2005	WHA resolution 58.27: Improving the containment of antimicrobial resistance
2007	WHA resolution 60.16: Progress in the rational use of medicines
2011	World Health Day on AMR, with six-point policy package
2012	The Evolving Threat of AMR: Options for Action (book)
2014	AMR: Global Report on Surveillance; WHA resolution 67.25: Antimicrobial resistance
2015	The Global Action Plan on AMR endorsed by WHA (resolution 68.7); Worldwide country situation analysis; First World Antibiotic Awareness Week
2016	Antimicrobial resistance: A manual for developing national action plans; Second World Antibiotic Awareness Week
2017	Reports on global priority list of antibiotic-resistant bacteria, and antibacterial agents in clinical development

Other recent high-level commitments on AMR

- High-level meeting of the UN General Assembly



**HIGH-LEVEL MEETING ON
ANTIMICROBIAL RESISTANCE**



21 SEPTEMBER 2016, UN HEADQUARTERS, NEW YORK

- Declaration of the G7 Health Ministers (Berlin, Oct 2015)
- Berlin Declaration of the G20 Health Ministers (May 2017)

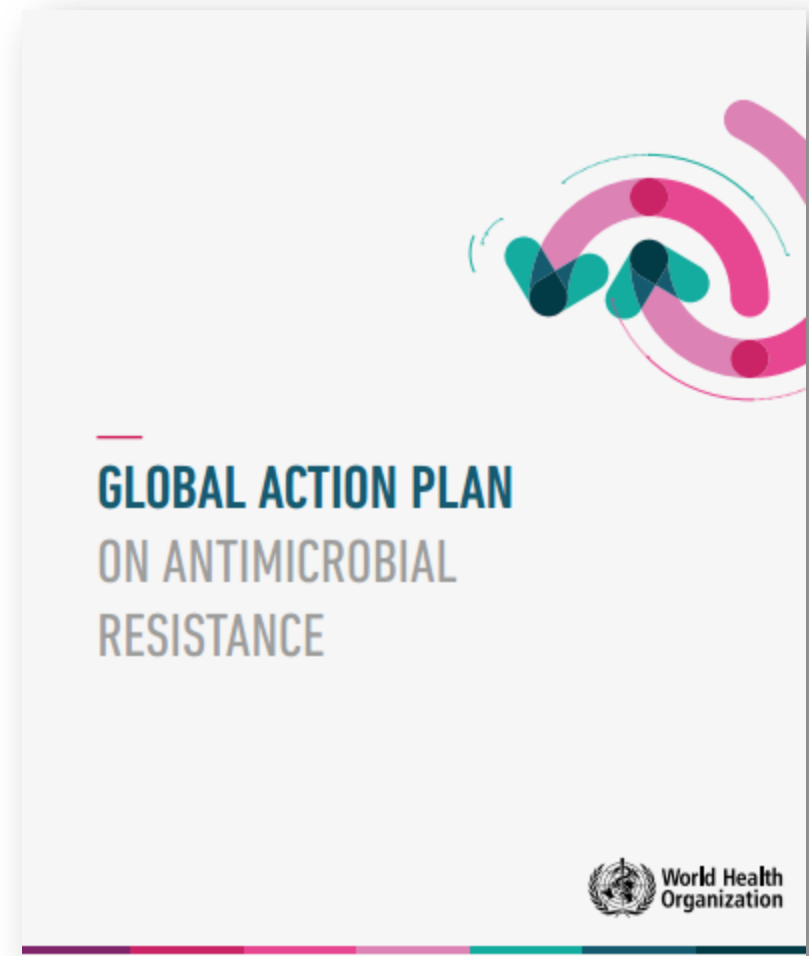


USAID
FROM THE AMERICAN PEOPLE

SIAPS The logo for SIAPS (Strategic Initiative for Antimicrobial Policy and Surveillance), featuring the acronym in green and a stylized blue figure.

WHO Global Action Plan on AMR (2015)

1. Improve awareness and understanding of AMR
2. Strengthen the knowledge and evidence base
3. Reduce the incidence of infection
4. Optimize use of antimicrobial medicines in humans/animals
5. Develop economic case for sustainable investment



National Action Plans (NAPs) on AMR

- Countries expected to have NAPs by 2017
- As of now, 44 national strategies/action plans in the WHO Library of NAPs
- 19 are NAPs, others are strategies
- Details of implementation absent in the majority
- Very few have actual indicators to monitor

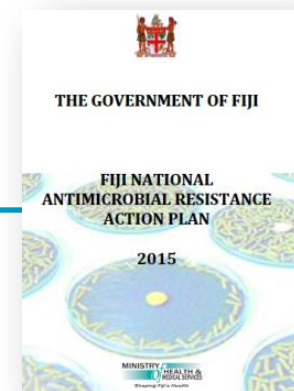
Further actions needed

Remaining countries to develop NAPs

Those with strategies to develop operational plans

Ensure NAPs and indicators are aligned with WHO guidance

Operationalize the plans and monitor progress



USAID
FROM THE AMERICAN PEOPLE

SIAPS

Global Health Security Agenda (GHSA)

Launched in 2014

Partnership of more than 50 nations, international organizations, and nongovernmental stakeholders

Aims to build countries' capacities to create a world safe from infectious disease threats, including AMR



USAID
FROM THE AMERICAN PEOPLE



GHSA countries and capacity building

- 59 countries members of GHSA (as of 23 Jun 2017)
- 14 GHSA countries supported by USAID
- 59 JEEs conducted between Feb 2016 and Oct 2017
- 13 countries thus far have their GHSA roadmaps on GHSA website

Further actions needed

More countries to join GHSA, conduct JEEs, and develop country roadmaps

Translate commitments into specific actions

Highlight targets and provide accountability

Monitor progress

AMR action package of GHSA

Support work by WHO/FAO/OIE through a One Health approach

Develop/implement national
action plans on AMR

Strengthen surveillance and lab
capacity

Improve conservation of existing
and future treatments

Support development of new
antibiotics and other technologies

Measured by

of national action plans agreed
and implemented at national level

Yearly reporting against progress
toward implementation

of countries participating in
twinning framework



USAID
FROM THE AMERICAN PEOPLE

SIAPS 

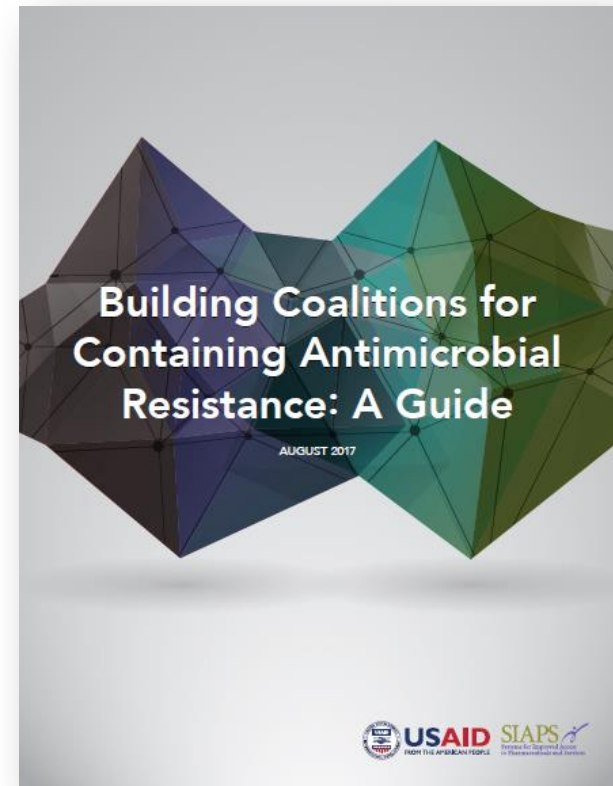
Examples of AMR-related system strengthening interventions supported by USAID/SIAPS



Advocacy and coalition building against AMR

The USAID/SIAPS Program and its predecessor programs have helped build capacity to generate coalitions for advocacy and interventions to fight AMR at the

- **Country level** in **Zambia**, **Ethiopia**, and **Namibia**
- **Regional level** in **Africa** through EPN, a faith-based regional network



Available for download at
<http://siapsprogram.org/publication/altview/building-coalitions-for-containing-antimicrobial-resistance-a-guide/english/>

**Regional advocacy
and coalition-
building: EPN example**



Since the first USAID/SPS-supported regional workshop on AMR in 2008, EPN member organizations in more than 12 countries have carried out more than 140 AMR-related activities

EPN developed and distributed AMR call-to-action document in five languages

EPN institutionalized AMR work by prioritizing it in its 2016–2020 Strategic Plan

Diversified their AMR-related funding with support from multiple partners (ReAct, Bread for the World, Difaem, Misereor, SPS, SIAPS)

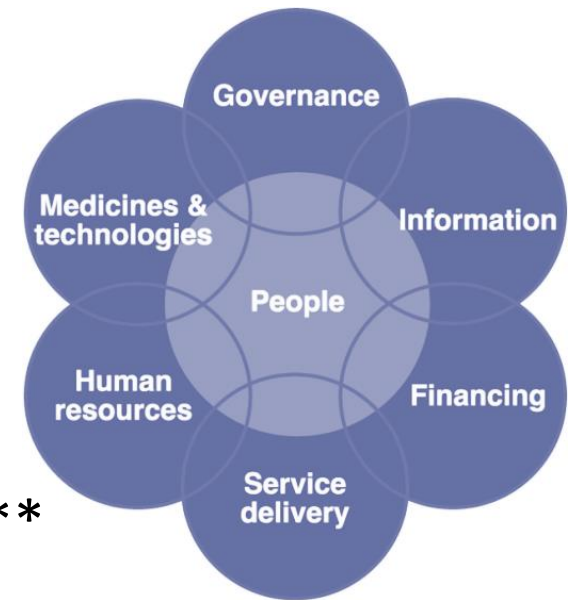


USAID
FROM THE AMERICAN PEOPLE

SIAPS

Antimicrobial stewardship in Jordanian hospitals

- **Problem:** Inappropriate use of antibiotic prophylaxis during cesarean section *
- **USAID/SIAPS/SPS-supported intervention:** **
 - Collaborated with multidisciplinary groups
 - Implemented locally developed protocols and procedures using CQI approach
 - **Focused on all six HSS core functions** to bring about sustainable changes in practice
 - Measured results through pre-agreed indicators



CQI – Continuous quality improvement

* Jordan Food and Drug Administration. Rational antibiotic use in Jordan: auditing antibiotic use targeting surgical prophylaxis at Jordanian hospitals. JFDA, Rational Drug Use Department, May 2009.

** Gammouh S and Joshi M. 2013. Improving Antibiotic Prophylaxis in Cesarean Section in Jordanian Hospitals: SIAPS Technical Report. Submitted to USAID by SIAPS/MSH, Arlington, VA.

<http://apps.who.int/medicinedocs/documents/s21698en/s21698en.pdf>



USAID
FROM THE AMERICAN PEOPLE



Combined results for three participating hospitals in Jordan

Indicator	2010 (baseline)	2012
Correct antibiotic use (cefazolin)	0%	86%*
Correct timing of first dose	0%	92%*
Correct number of doses	0%	88%*
Result area	Achievement	
Average cost for antibiotic prophylaxis per case	79% decrease in 2012 compared to baseline	
Cesarean section surgical site infection rate	1.59% (within international rate benchmark**)	

* in log-captured cases (log capture rate = 81%)

** Ghuman M et al. Post-caesarean section surgical site infection: rate and risk factors.
The New Zealand Medical Journal 2011; 124



USAID
FROM THE AMERICAN PEOPLE



GHeL AMR courses (parts 1 and 2)

AMR part 1 course (updated)

Published on
16 Sep 2016

By 30 Sep 2017,
1,454 individuals
(54% females,
46% males)
from **83 countries** had
taken the course and
earned certificates

AMR part 2 course

Published on
11 Nov 2015

By 30 Sep 2017,
1,168 individuals
(50% females,
50% males)
from **80 countries** had
taken the course and
earned certificates

Additional USAID/SIAPS-supported country examples

- National strategy/**action plan on AMR** drafted/finalized in Ethiopia, Namibia, Sierra Leone, South Africa, and Swaziland
- South Africa adapted and institutionalized the **Infection Control Self-Assessment Tool** (ICAT) as the national IPC tool
- Following capacity-building training of **journalists**, more than 218 stories related to AMR and rational use broadcasted on radio and TV and published in print media between 2012 and 2014 in Ethiopia
- University of Namibia integrated and implemented AMR and rational use topics in **preservice pharmacy training**
- **Chlorhexidine 7.1%** for newborn cord care introduced in Afghanistan, DRC, and Pakistan using a framework for introduction
- **Amoxicillin dispersible tablets** registered and included in EML in DRC for treating pneumonia in children < 5; rational use supported through job aids for providers and dispensing envelopes for caregivers



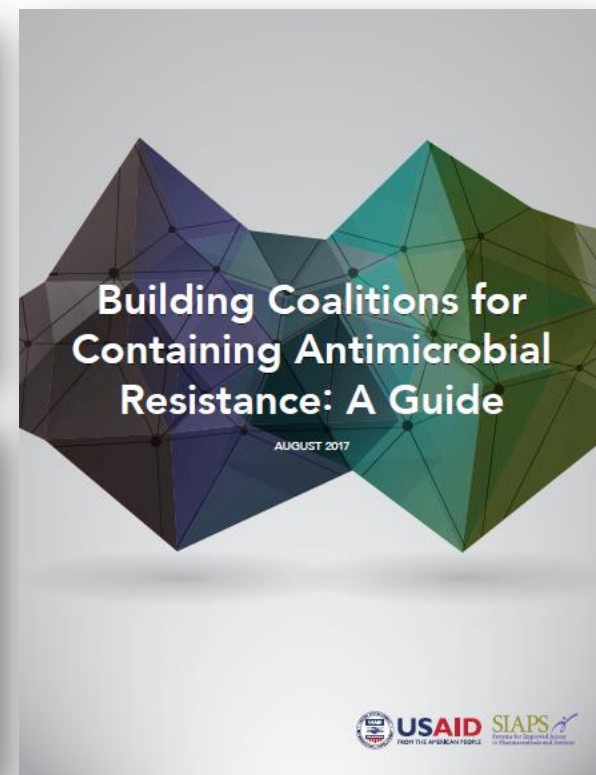
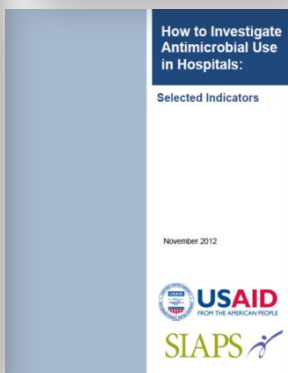
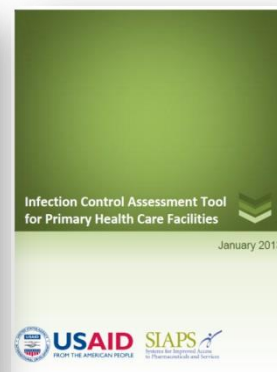
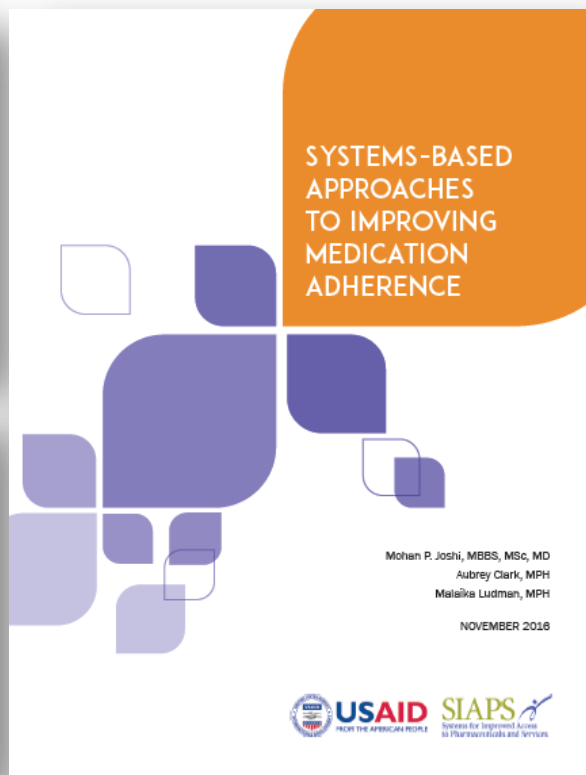
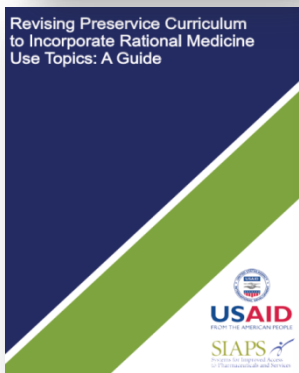
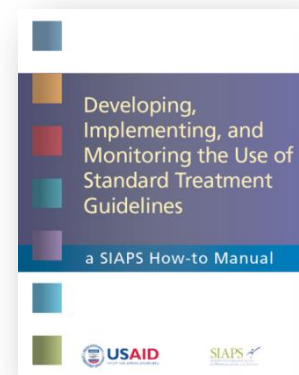
USAID
FROM THE AMERICAN PEOPLE



Key priorities

- ☐ “Operationalize” NAPs and GHSA country roadmaps
- ☐ Monitor progress based on agreed indicators
- ☐ Focus on system strengthening for sustainable results
- ☐ Ensure education and awareness lead to actual behavior change
- ☐ Strengthen regulatory systems to ensure the quality and safety of antimicrobials
- ☐ Put the concept of One Health into real practice
- ☐ Ensure access without excess and misuse
- ☐ Mobilize community, private sector, and CSOs
- ☐ Enhance public-private partnerships
- ☐ Integrate AMR into investments to attain SDGs
- ☐ Protect recent supply chain investments by strengthening enabling environment factors (e.g., selection, regulation, and rational use of antimicrobials)

AMR-related USAID/SIAPS publications

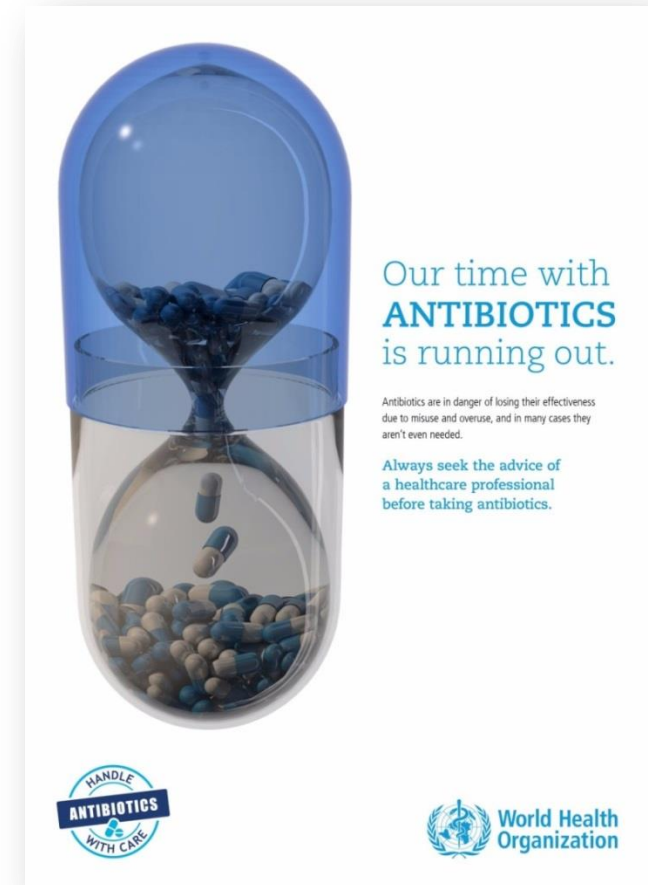


USAID
FROM THE AMERICAN PEOPLE

SIAPS

Conclusion

- Antimicrobial pipeline is running dry, with few new products in development
- Need to intensify and expand stewardship activities to preserve effectiveness of existing antimicrobials
- Also need to have proactive strategies to preserve effectiveness of new antimicrobials as they get introduced through ongoing and future initiatives
- Need to continue impressive recent progress toward developing NAPs and GHSA plans based on One Health concept
- Ensure that these plans are operationalized with regular progress monitoring



USAID
FROM THE AMERICAN PEOPLE

SIAPS