

Om sumukhayanamaha





INTEGRATED ANTIMICROBIAL STEWARDSHIP MODEL FOR GLOBAL CONTROL OF H PYLORI INFECTIONS” PUBLIC AND PRIMARY HEALTH PERSPECTIVES

Gunturu Revathi, MD

Head of Clinical Microbiology

Dept. of Pathology

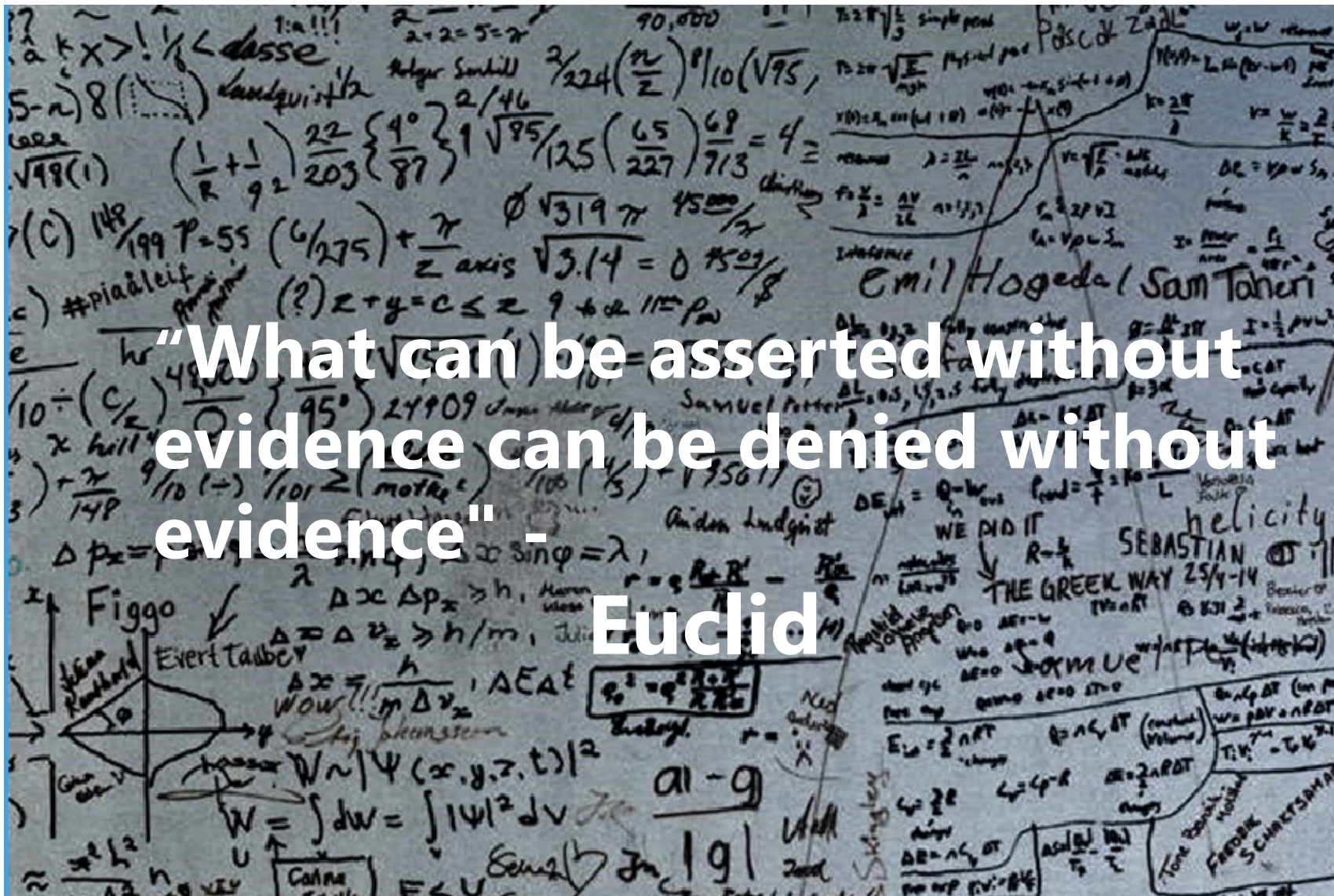
The Aga Khan University Hospital

Nairobi, KENYA



**I have no disclosures or conflicts of interest relevant to this presentation
I do not endorse any commercial products or drugs**





Euclid, a pioneer of mathematics in ancient Greece, shows the need for evidence in the development of reliable knowledge.







THE AGA KHAN UNIVERSITY



Organization Accredited
by Joint Commission International

IMPROVING THE QUALITY AND SAFETY OF
HEALTHCARE FOR EVERY PATIENT ACROSS THE GLOBE













Peter Malfertheiner

**•Otto-von-Guericke-Universität
Magdeburg Germany**



**Andrew Kimanga Nyerere JKUAT
Doctoral fellow In AKUH 2009- 2012
Faculty of Med Microbiology at JKUAT
Chairman of Microbiology at JKUAT**



**Prof Yoshio Yamaoka
Oita University, Japan**



**Prof Yasutoshi Kido
Osaka University**



**Dr Evariste Tshibangu
Osaka University**



Dr Smita Devani

Dr MV Shah



Dr Allan Rajula,



Dr Rose Kamenwa



Dr Ahmed Laving



Stephen Njoroge



HELICOBACTER PYLORI DIAGNOSIS, VIRULENCE
GENES, RESISTANCE TO CONVENTIONAL
ANTIBIOTICS AND ANTIMICROBIAL ACTIVITY OF
SELECTED MEDICINAL PLANTS ON ISOLATES
OBTAINED FROM PATIENTS UNDERGOING
ENDOSCOPY AT AGA KHAN UNIVERSITY
HOSPITAL, KENYA



Catherine Mwangi



**Differential antibiotic susceptibility of
H pylori isolates from gastric antrum and corpus**

ASSOCIATION OF HELICOBACTER PYLORI CagA AND VacA GENOTYPES WITH GASTRIC ADENOCARCINOMA IN KENYA



DR. PRISCILLA WAITHIRA NJENGA

**A dissertation submitted in part
fulfillment of the requirements for the
degree of**

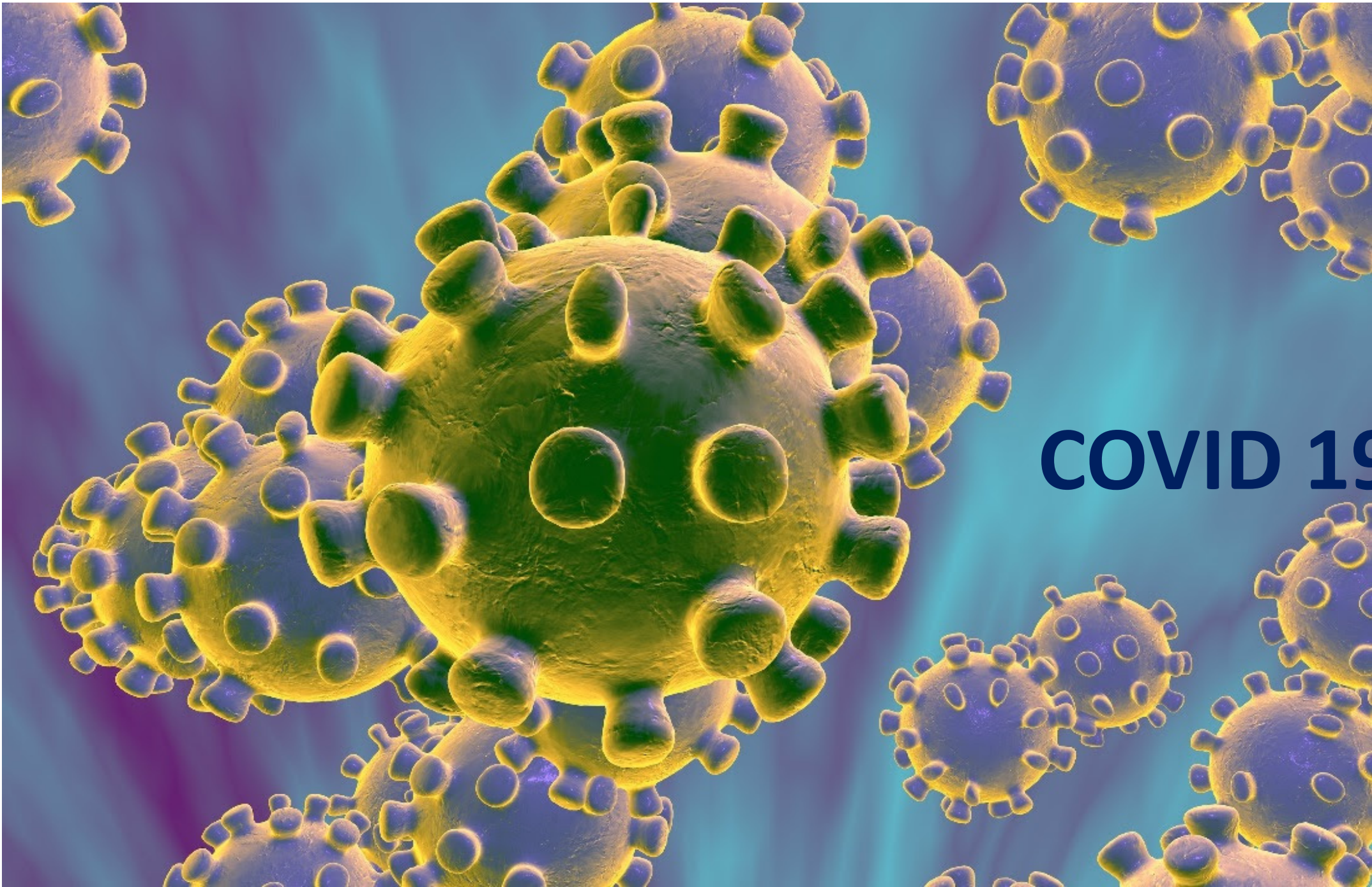
**Master of Medicine
In Anatomic Pathology**



The Perfect Storm

Antimicrobial Resistance





COVID 19

Antibiotic resistance accelerates the vicious circle of poverty and infectious disease



People living in poverty are more prone to infectious diseases



Circumstances of poverty increase the spread of infectious diseases



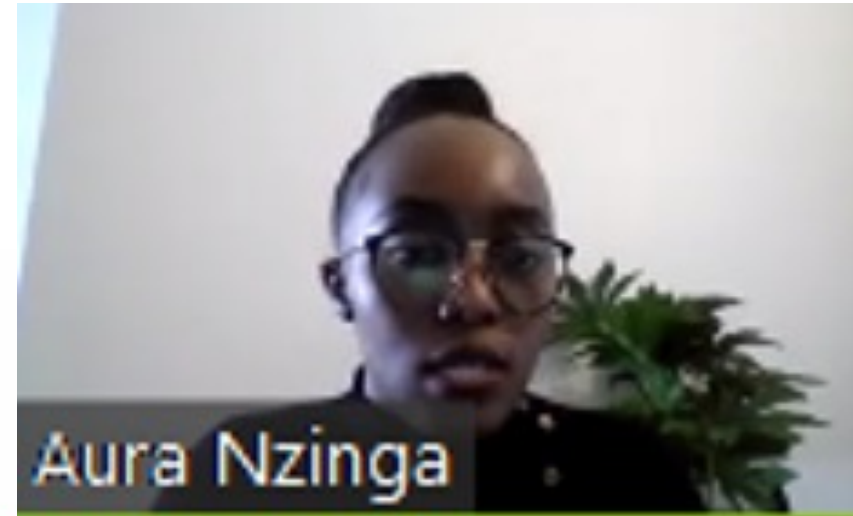
The cost of having an infectious disease drives people into poverty



Antibiotic resistance significantly increases the cost of treatment, driving people into poverty or making treatment inaccessible



Research Question & Objectives



What is the knowledge and practice of Kenyan paediatricians regarding helicobacter pylori infection in children?

Primary objective

To evaluate the **level of knowledge and practice** of Kenyan paediatricians regarding helicobacter pylori infection in children.

Secondary objectives

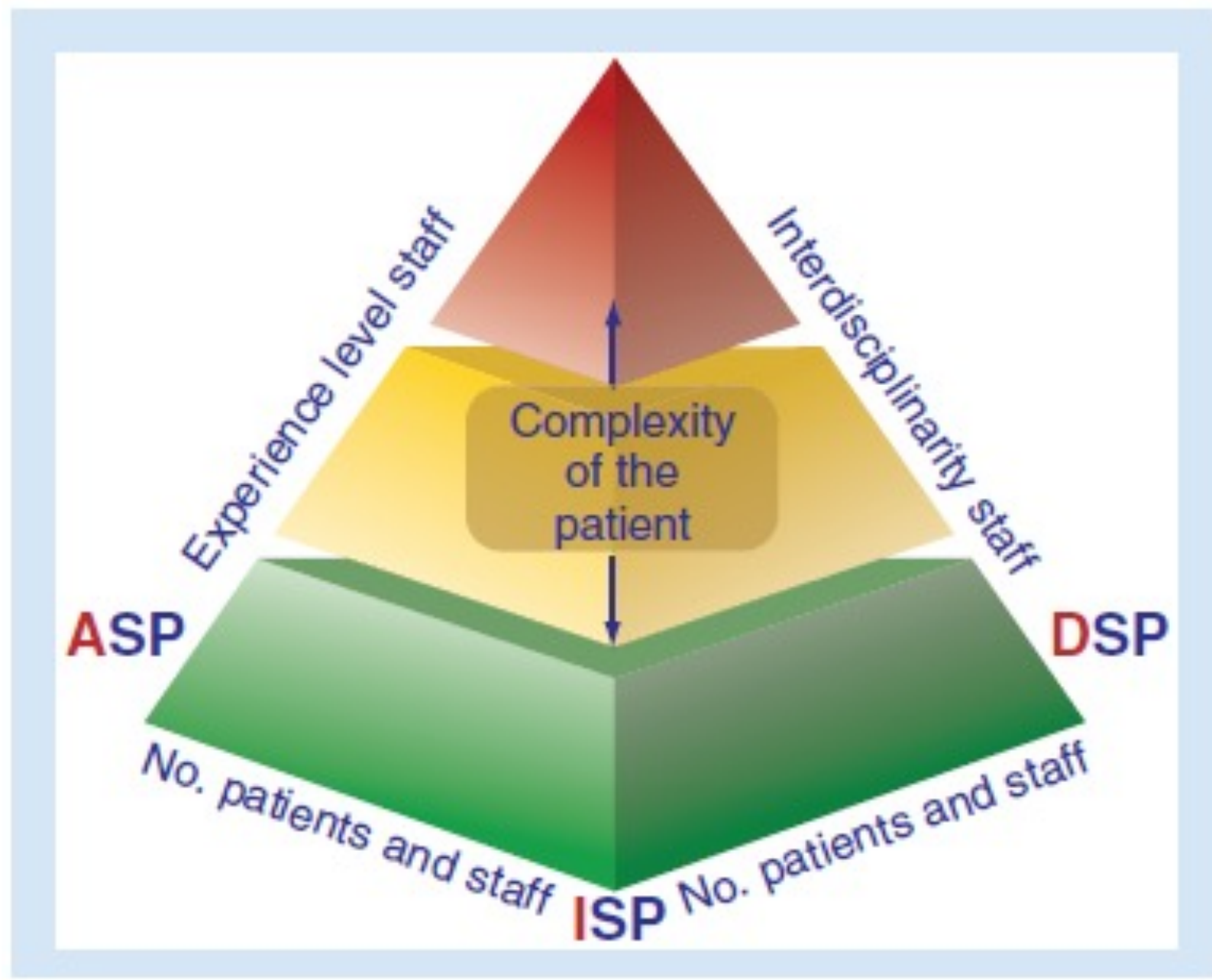
To determine the **factors influencing knowledge and practice** of Kenyan paediatricians regarding helicobacter pylori infection in children

Conclusion



The study captured knowledge and practice of all paediatricians in Kenya and revealed that overall, paediatricians had poor knowledge and practice regarding childhood H pylori.

Having had CME on childhood H pylori significantly contributed to higher knowledge and practice scores.





Brief

Antimicrobial resistance and primary health care

WHO/HIS/SDS/2018.57

© World Health Organization 2018. Some rights reserved. This work is available under the CC BY-NC-SA 3.0 IGO licence.



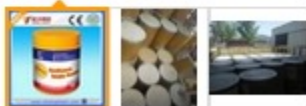
NEW



Home > All Industries > Chemicals > Pharmaceuticals > Animal Pharmaceuticals (187814) [Subscribe to Trade Alert](#)



View larger image



Add to Compare Share

Enrofloxacin hcl raw material pharmaceutical grade for animal use

FOB Reference Price: [Get Latest Price](#)

US \$15-20 / Kilograms | 100 Kilogram/Kilograms (Min. Order)

[Contact Supplier](#)

[Leave Messages](#)

Seller Support: Trade Assurance – To protect your orders from payment to delivery

Payment: [More ▾](#)

Shipping: **50% OFF** Alibaba.com Ocean Shipping Service from China to U.S
[Get shipping quote](#)



People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans

19 October 2023 | Publication



Overview

This document outlines the concept and content of the WHO people-centred approach to addressing antimicrobial resistance (AMR) in the human health sector. The proposed approach recognizes and aims to address the challenges and health system barriers people face when accessing health services to prevent, diagnose and treat (drug-resistant) infections. It puts people and their needs at the centre of the AMR response and guides policy-makers in taking programmatic and comprehensive actions to mitigate AMR in line with a proposed package of core interventions. These interventions are based on a review of four pillars and two foundational steps that are critical to overcome barriers faced by people and health systems in addressing AMR.



WHO Bacterial Priority Pathogens List, 2024

Bacterial pathogens of public health importance to guide research, development and strategies to prevent and control antimicrobial resistance



Health Topics ▾

Countries ▾

Newsroom ▾

Emergencies ▾

Data ▾

About WHO ▾

[Home](#) / [Publications](#) / [Overview](#) /

WHO bacterial priority pathogens list, 2024: Bacterial pathogens of public health importance to guide research, development and strategies to prevent and control antimicrobial resistance

WHO bacterial priority pathogens list, 2024: Bacterial pathogens of public health importance to guide research, development and strategies to prevent and control antimicrobial resistance

17 May 2024 | Report



Critical group



Enterobacteriales
carbapenem-resistant



Enterobacteriales
third-generation
cephalosporin-resistant



*Acinetobacter
baumannii*
carbapenem-resistant

High group



Salmonella Typhi
fluoroquinolone-resistant



Shigella spp.
fluoroquinolone-resistant



*Enterococcus
faecium*
vancomycin-resistant



*Pseudomonas
aeruginosa*
carbapenem-resistant



Non-typhoidal
Salmonella
fluoroquinolone-resistant

Medium group



Group A
Streptococci
macrolide-resistant



*Streptococcus
pneumoniae*
macrolide-resistant



*Haemophilus
influenzae*
ampicillin-resistant



Group B
Streptococci
penicillin-resistant





Global Helicobacter Pylori Testing Market by Manufacturers, Countries, Type and Application, Forecast to 2022





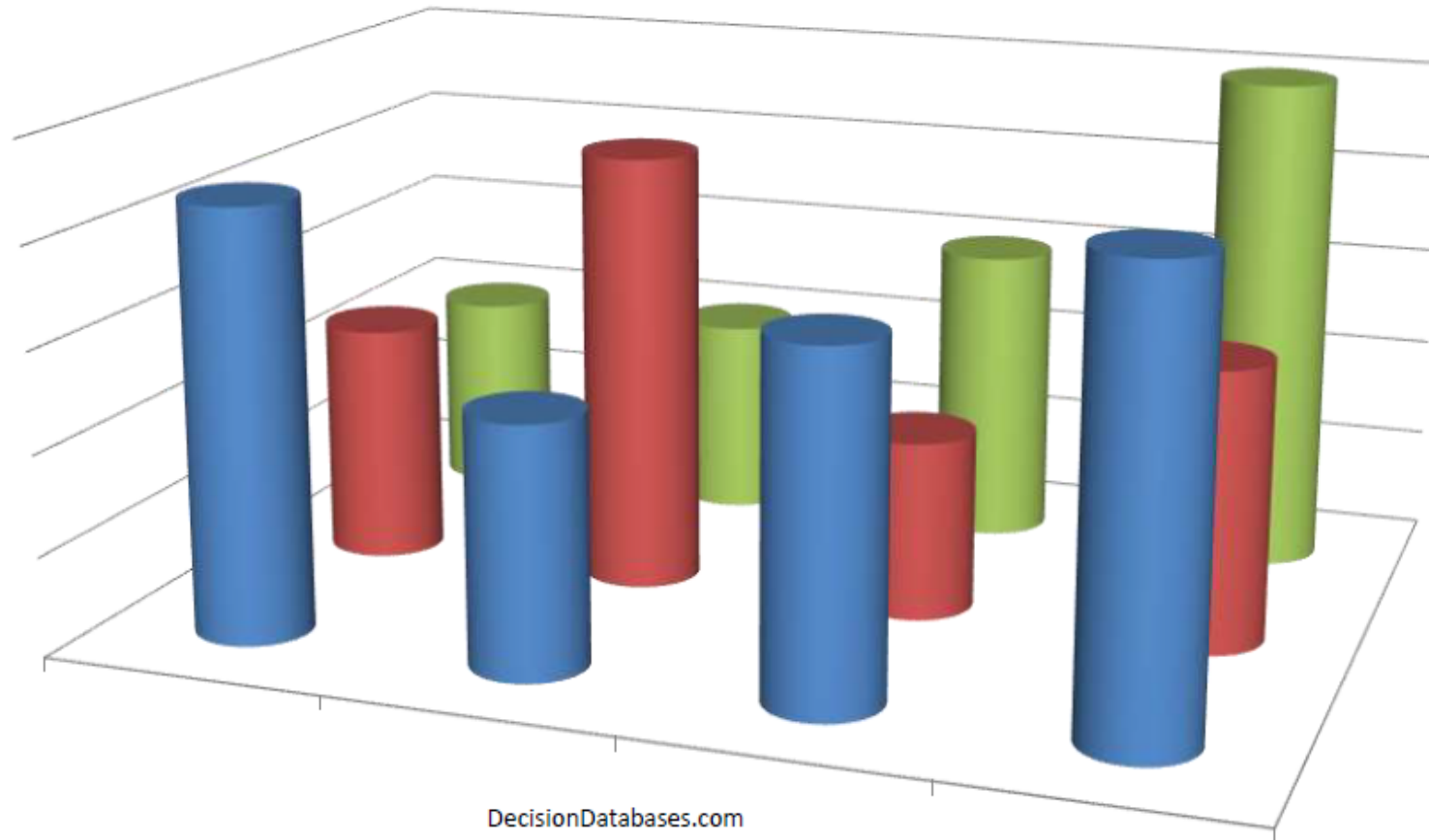
This report studies the Helicobacter pylori Testing market
It is a comprehensive overview, market shares, and growth opportunities of Helicobacter pylori Testing market by product type, application, key manufacturers and key regions and countries.

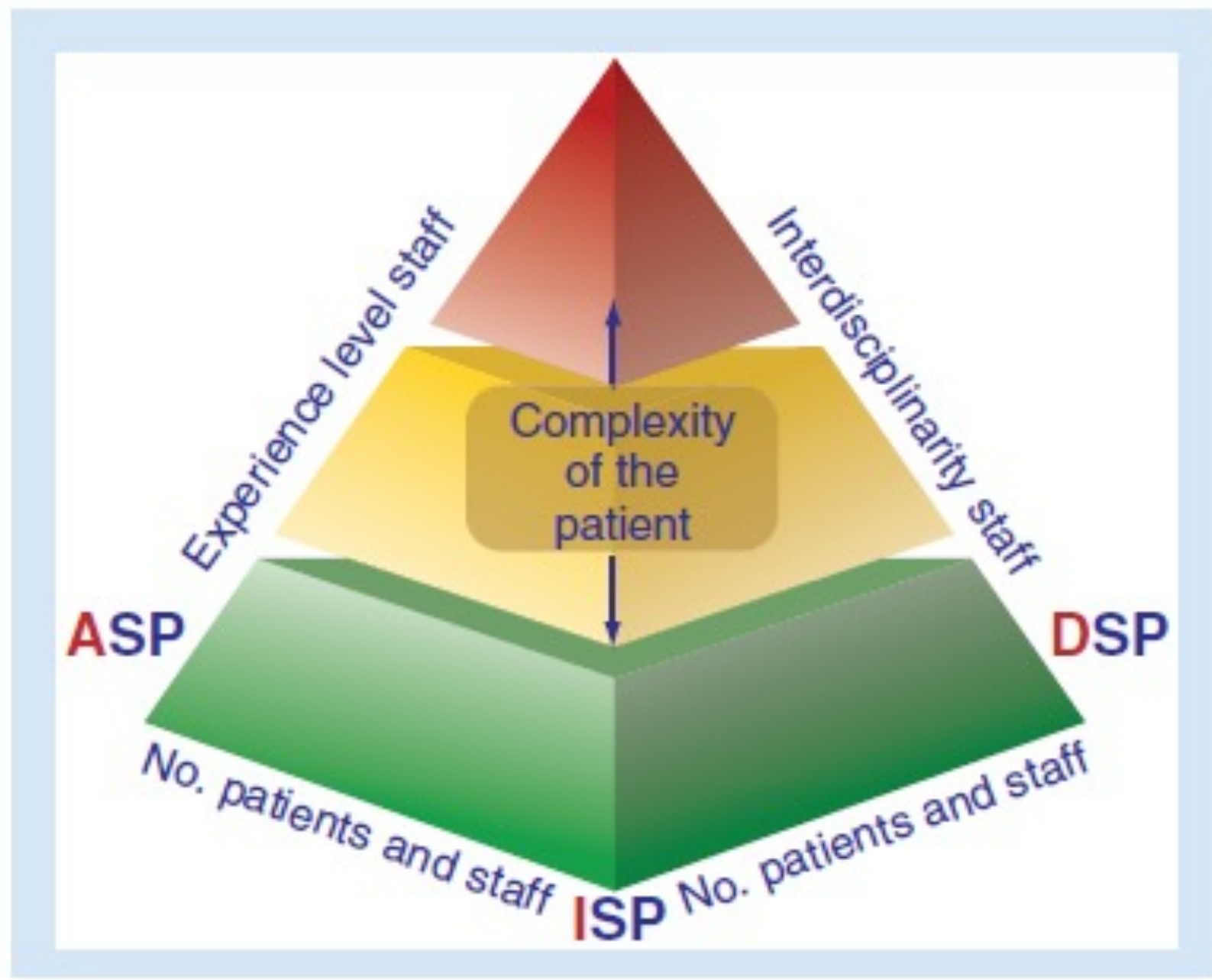
North American Helicobacter pylori Testing market is valued at 127.37 million USD in 2016

It is expected to reach 189.73 million USD by the end of 2022



Global Helicobacter Pylori Testing Market Growth 2019-2024







Current challenges with H pylori infections in LMICs

Large numbers of infected populations due to lack of WASH

Cheap substandard stool antigen detection tests are sold by vendors

Labs use these kits without Internal or external QC

Clinicians with poor training background and poor knowledge base – testing for stool antigen and treating with antibiotics – a package sold by pharma.

False positive and false negative results are common due to irrational test requests

Drug resistance is bound to develop in this environment

Good number of treated patients refractory to treatment

Scant information on antibiogram of H pylori



Most of the Ministries of Health (MOH) in Africa do not have a National Diagnostic Policy or National Clinical Laboratory Policy.

No CONTROLS ON SPURIOUS MEDICAL PRACTICES



There's something you should know

Access the latest trial data, expert perspectives, and treatment information from industry

VISIT YOUR MEDSCAPE
INVITATIONS TRACKER >

ADVERTISEMENT

News & Perspective

Making the Correct Diagnosis: The Cornerstone of Antibiotic Stewardship

Neil Gaffin, MD; Brad Spellberg, MD

DISCLOSURES | May 19, 2017



✓ Added to Email Alerts

There's
you sh

Access the
data, exper
and treatm
from Indust



Misdiagnoses All Too Common: 1 in 20 US Adult Patients

Diedra Henderson

April 22, 2014

74 Read Comments



Added to Email Alerts

At least 1 in 20 US adults receiving outpatient care, or 12 million patients annually, are misdiagnosed, and half of these medical errors could be harmful, according to a population-based estimate.

The authors hope the study prompts systematic measurement and reduction of medical errors.

Hardeep Singh, MD, MPH, from the Houston Veterans Affairs Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey Veterans Affairs Medical Center, and the Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston, Texas, and coauthors published their results [online](#) April 17 in *BMJ Quality and Safety*.

Because definitions of medical errors vary, Dr. Singh and colleagues



REVIEW



EDUCATIONAL OBJECTIVE: Readers will treat *Helicobacter pylori* infections according to likely susceptibility to antibiotics

AKIKO SHIOTANI, MD, PhD

Professor, Department of Internal Medicine, Kawasaki Medical School, Okayama, Japan

HONG LU, MD, PhD

GI Division, Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai Institution of Digestive Disease; Key Laboratory of Gastroenterology & Hepatology, Ministry of Health, Shanghai, China; Vice-director of Chinese *H pylori* Study Group of Chinese Society of Gastroenterology

MARIA PINA DORE, MD, PhD

GI Fellowship Program Director, Dipartimento di Medicina Clinica e Sperimentale, Clinica Medica, University of Sassari, Sassari, Italy

DAVID Y. GRAHAM, MD

Department of Medicine, Michael E. DeBakey VAMC, and Professor, Baylor College of Medicine, Houston, TX

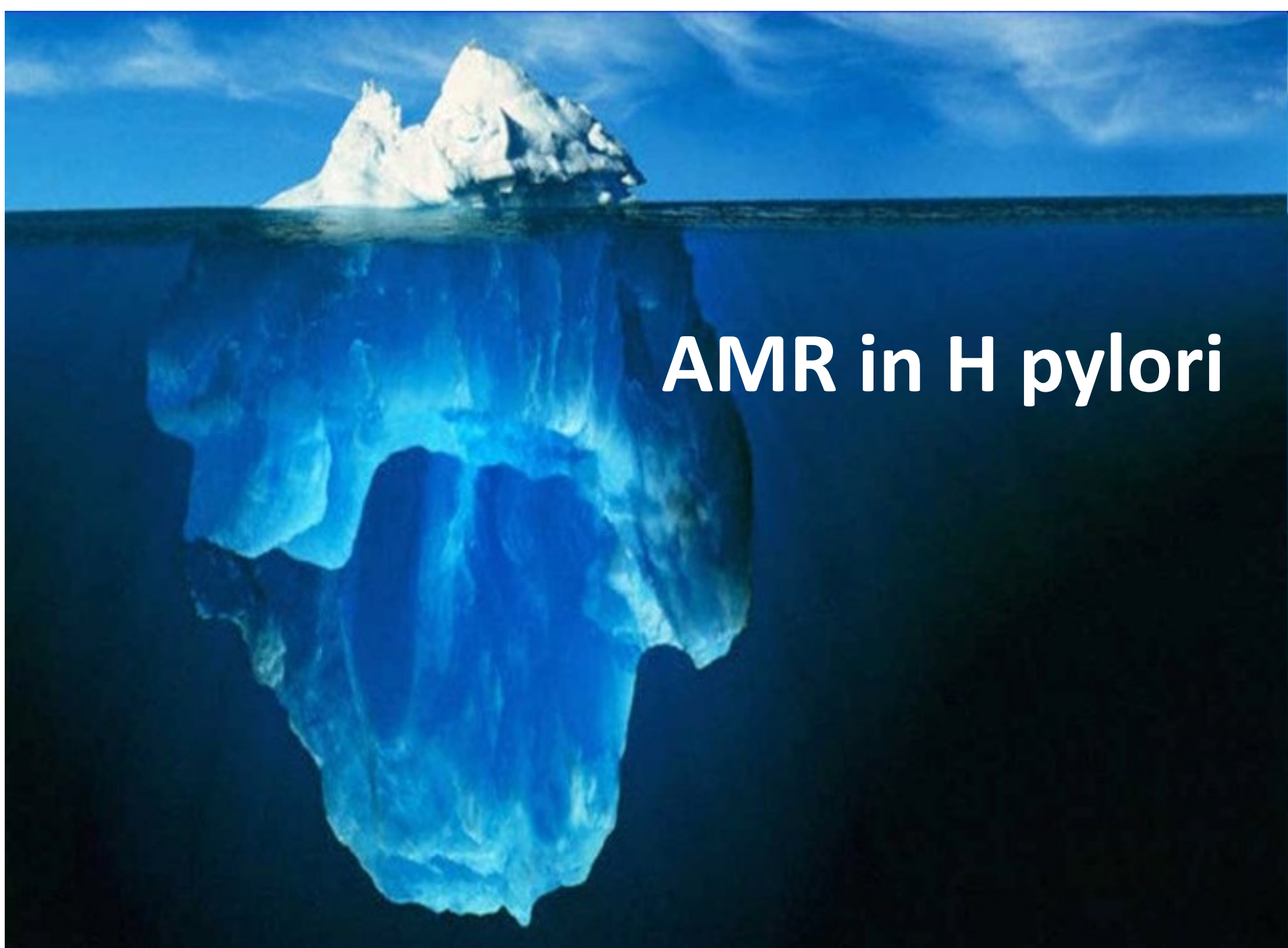
Treating *Helicobacter pylori* effectively while minimizing misuse of antibiotics

ABSTRACT

Experts now recommend that all *Helicobacter pylori* infections be eradicated unless there are compelling reasons not to. As with other infectious diseases, effective therapy should be based on susceptibility.

HELICOBACTER PYLORI INFECTION is an infectious disease and should be treated like one, with due consideration of antibiotic resistance and stewardship.¹⁻⁴

This was the consensus of the 2015 Kyoto *H pylori* conference,² and it signaled a funda-



AMR in H pylori



Different antibiotic susceptibility between antrum and corpus of the stomach, a possible reason for treatment failure of *Helicobacter pylori* infection

Michael Selgrad, Ina Tammer, Cosima Langner, Jan Bornschein, Julia Meißle, Arne Kandulski, Mariya Varbanova, Thomas Wex, Dirk Schlüter, Peter Malfertheiner

Michael Selgrad, Cosima Langner, Jan Bornschein, Julia Meißle, Arne Kandulski, Mariya Varbanova, Thomas Wex, Peter Malfertheiner, Department of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke-University of

Magdeburg, Germany. Correspondence: Michael Selgrad, MD, Department of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke-University of Magdeburg, Leipziger Str. 44, D-39104 Magdeburg, Germany. Tel: +49 391 2015300. Fax: +49 391 2015300. Email: selgrad@medizin.uni-magdeburg.de



Important but Unanswered Questions in our region

- **Is AMR surveillance in H pylori important?**
- **What can we do to begin this task somewhere?**
- **Who could take the lead?**
- **What are the implementation issues from a local and/or national perspective?**
- **Who should be responsible for the management of this recommendation?**
- **What are the priority issues?**



GI Endoscopes: Shift from Disinfection to Sterilization

Rutala, Weber. JAMA 2014. 312:1405-1406

EDITORIAL

Editorials represent the opinions of the authors and *JAMA* and not those of the American Medical Association.

Gastrointestinal Endoscopes A Need to Shift From Disinfection to Sterilization?

William A. Rutala, PhD, MPH; David J. Weber, MD, MPH

More than 10 million gastrointestinal endoscopic procedures are performed annually in the United States for diagnostic purposes, therapeutic interventions, or both.¹ Because gastrointestinal endoscopes contact mucosal surfaces, use of a contaminated endoscope may lead to patient-to-patient transmission of potential pathogens with a subsequent risk of infection.¹

In this issue of *JAMA*, Epstein and colleagues² report findings from their investigation of a cluster of New Delhi metallo- β -lactamase (NDM)-producing *Escherichia coli* associated with gastrointestinal endoscopy that occurred from March 2013 to

July 2013 in a single hospital in northeastern Illinois. During the 5-month period, 9 pa-

First, endoscopes are semicritical devices, which contact mucous membranes or nonintact skin, and require at least high-level disinfection.^{3,4} High-level disinfection achieves complete elimination of all microorganisms, except for small numbers of bacterial spores. Because flexible gastrointestinal endoscopic instruments are heat labile, only high-level disinfection with chemical agents or low-temperature sterilization technologies are possible.³ However, no low-temperature sterilization technology is US Food and Drug Administration (FDA)-cleared for gastrointestinal endoscopes such as duodenoscopes.

Second, more health care-associated outbreaks and clusters of infection have been linked to contaminated endoscopes than to any other medical device.^{3,5} However, until now,



Related article page 1447



Infections/Outbreaks Associated with Semicritical Medical Devices

Rutala, Weber. Am J Infect Control. Rutala WA, Weber DJ. Am J Infect Control. 2019 Jun;47S:A79-A89.

- HBV and HCV transmission during endoscopy and use of semicritical medical devices can occur, but it is rare (3)
- No articles related to possible transmission of HIV via medical device
- Greatest evidence of transmission associated with GI endoscopes/bronchoscopes (~130 outbreaks) likely due to microbial load and complexity.
- Several other semicritical medical devices are associated with infections related to inadequate reprocessing

Table 2

Infections and outbreaks associated with semicritical medical devices*

Instruments	# Outbreaks/ Infections	# Outbreaks/ Infections with bloodborne pathogens
Vaginal probes	0**	0
Nasal endoscopes	0	0
Hysteroscopes	0	0
Laryngoscopes	2 ⁴³⁻⁴⁵	0
Urologic instrumentation (eg, cystoscopes, ureteroscopes)	8 ⁴⁶⁻⁵³	0
Transrectal-ultrasound guided prostate probes	1 ⁴⁰	0
Transesophageal echocardiogram	5 ^{51,54-57}	0
Applanation tonometers	2 ^{41,42}	0
GI endoscopes/bronchoscopes	~130 ^{7,8}	3 HBV ³⁴ ; HCV ^{35,36}

GI, gastrointestinal; HBV, hepatitis B virus; HCV, hepatitis C virus.

*These infections/outbreaks were found in the peer-review literature through PubMed and Google.

**Does not include outbreaks associated with contaminated ultrasound gel used with vaginal probes or transmission via health care personnel.



Is H pylori protective ? OR Destructive?

We have deal with it depending on the answer to this question.

Treat if Destructive **Infect People with it if it protects**

Can an organism be both at the same time?



AMR issue

Test and Treat School –

Which Test? Stool Antigen? **Many are positive**

Treat all those positive? **Promotes AMR**

Which Antibiotic / antibiotics?

To Control AMR – No AB prescribing with out evidence

We need **AST results** as evidence.

We do not have lab capacity for this.



H pylori Antibigram Results – IMPOSSIBLE IN AFRICAN SETTING AT PRESENT

We are struggling with MICROBIOLOGY LAB CAPACITY
Salmonella and Shigella – big problem
Are asking for moon and stars?

H pylori Culture – Technically Challenging
AST - Big Controversy of Approved Techniques
Are the current Breakpoints Correct?
THERE IS NO PAGE for H pylori IN CLSI METHODOLOGY BOOK



JUST ONE TECHNICAL PROBLEM

Routine AST service for our GE team

Out of 25 gastric biopsies (urease positive) 11 failed to grow in culture

How do I deal with the clinician requesting culture and AST for a problem patient? (Patient charged 75 USD)



What is the solution for failed cultures?

Non Culture Techniques !!! Genotypic AST is the solution

**mAST Method using WGS – Nanopore Technology / MinION
Sequencing of the Nucleic Acid Extract of the tissue.**

**Resistance Genes for Multiple Antibiotics Detected
Reported to the clinician as an Antibiogram. (?Expenses)**

Did We Solve This Problem?



Forgetting Unaffordable Expenses in LMICs Setting and Issues of Expertise Scarcely available in LMICs

Do we really have a solution in Genotypic AST report?

Many Slips –

Lab and Hospital Accreditation Certificates require -

- 1. Approvals of the technology for the purpose by professional bodies by Formal Clinical Validation process**
- 2. Internal QC controls**
- 3. External QC program**
- 4. Ability to pass JCIA and CAP audit process**

Scientific Hurdles When We Start Walking This Path

Experience is showing -



AMR Genes Are Detected In H. Pylori Negative Biopsy Tissues.

Creating More Questions

1. What are these genes?
2. Remnants of Previously Present Resistant H pylori?
3. How to interpret them for this patient? (Remember -Patient Symptomatic)
4. Are they AMR genes from other GI organisms such as E.coli, Klebsiella or others which are abundant in GI tract?
5. AMR genes are known to have environmental presence and a significant threat



***Klebsiella pneumoniae* as a key trafficker of drug resistance genes from environmental to clinically important bacteria**

Kelly L Wyres and Kathryn E Holt



Klebsiella pneumoniae is an opportunistic bacterial pathogen known for its high frequency and diversity of antimicrobial resistance (AMR) genes. In addition to being a significant clinical problem in its own right, *K. pneumoniae* is the species within which several new AMR genes were first discovered before spreading to other pathogens (e.g. carbapenem-resistance genes KPC, OXA-48 and NDM-1). Whilst *K. pneumoniae*'s contribution to the overall AMR crisis is impossible to quantify, current evidence suggests it has a wider ecological distribution, significantly more varied DNA composition, greater AMR gene diversity and a higher plasmid burden than other Gram negative opportunists. Hence we propose it plays a key role in disseminating AMR genes from environmental microbes to clinically important pathogens.

Address

Department of Biochemistry and Molecular Biology, Bio21 Molecular Science and Biotechnology Institute, University of Melbourne, 30 Flemington Rd, Parkville, Victoria 3010, Australia

more antibiotics, and individual strains have accumulated resistance to many additional drugs [1]. The Gram negative ESKAPE pathogens are considered the greatest threat, due to the emergence of strains that are resistant to all or most available antibiotics [2**]. Accumulation of AMR in these organisms is primarily due to horizontal gene transfer (HGT) aided by plasmids and mobile genetic elements [1]. The catalogue of known mobile AMR genes subject to HGT amongst Gram negative pathogens numbers in the hundreds [3]. The origins of the AMR genes themselves are environmental bacteria (particularly soil bacteria), assumed to be those which have co-evolved with the relevant antimicrobial producing organisms for millennia [4–6]; however there is typically a lag of several years between the clinical use of a drug and the arrival of relevant mobile AMR genes in human pathogen populations [7]. Hundreds of mobile AMR genes have been found in *K. pneumoniae* [8,9], the species associated with the earliest reports of many AMR genes before their dispersal amongst other clini-



- 1. Is this information CLINICALLY USEFUL ?**
- 2. OR More Complicating for the Already Complicated Scenario?**

ADD More Fuel To Fire – Special Populations

- 1. Children**
- 2. Pregnant Women**
- 3. Long COVID 19**
- 4. PLWHIV**
- 5. Cancer patients**
- 6. Diabetics, Renal failure, Hepatic Failure - - - - -**



Human Microbiome in Health and Disease





Current studies on AMR

Focus mostly on single pathogenic organisms in culture.

Future studies on AMR

Will involve pathogenic, commensal and environmental bacteria as microbial colonies, collections and communities including biofilms.

H pylori studies may need to include the background microbiota



IN ALL THESE COMPLICATIONS

WHAT IS THE ROLE OF POPULAR MODERN SCIENCES

Microbiome and Virome

Resistome in the GUT

Metabolomics

Pharmacogenetics

**What is the Role of Various Schools of Alternative
Medicine**

SPECIAL REPORT



Medicine with a side of mysticism: Top hospitals promote unproven therapies

By CASEY ROSS [@byCaseyRoss](#), MAX BLAU [@maxblau](#), and KATE SHERIDAN [@sheridan_kate](#)

Illustration by MOLLY FERGUSON *for* STAT

MARCH 7, 2017





THANK YOU FOR YOUR ATTENTION !

