Antimicrobial stewardship program: Best practice to implement in your settings

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American Board in Internal Medicine, Geriatric and Infectious Diseases
Chairperson of HIV management team in MOH
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Chairperson of the geriatric services in secondary care
Associate Professor in Arabian Gulf University

Outline

- 1. The Importance of AMR
- 2. Regional Data
- 3. The core components of antibiotic stewardship Program (Published And experience)
- 4. Kingdom of Bahrain experience

The future is difficult to predict...

> "There are few public health issues of potentially greater importance for society than antibiotic resistance"
>
> 2013 CMO Prof Dame Sally Davies

1994

2015

March 28, 1994
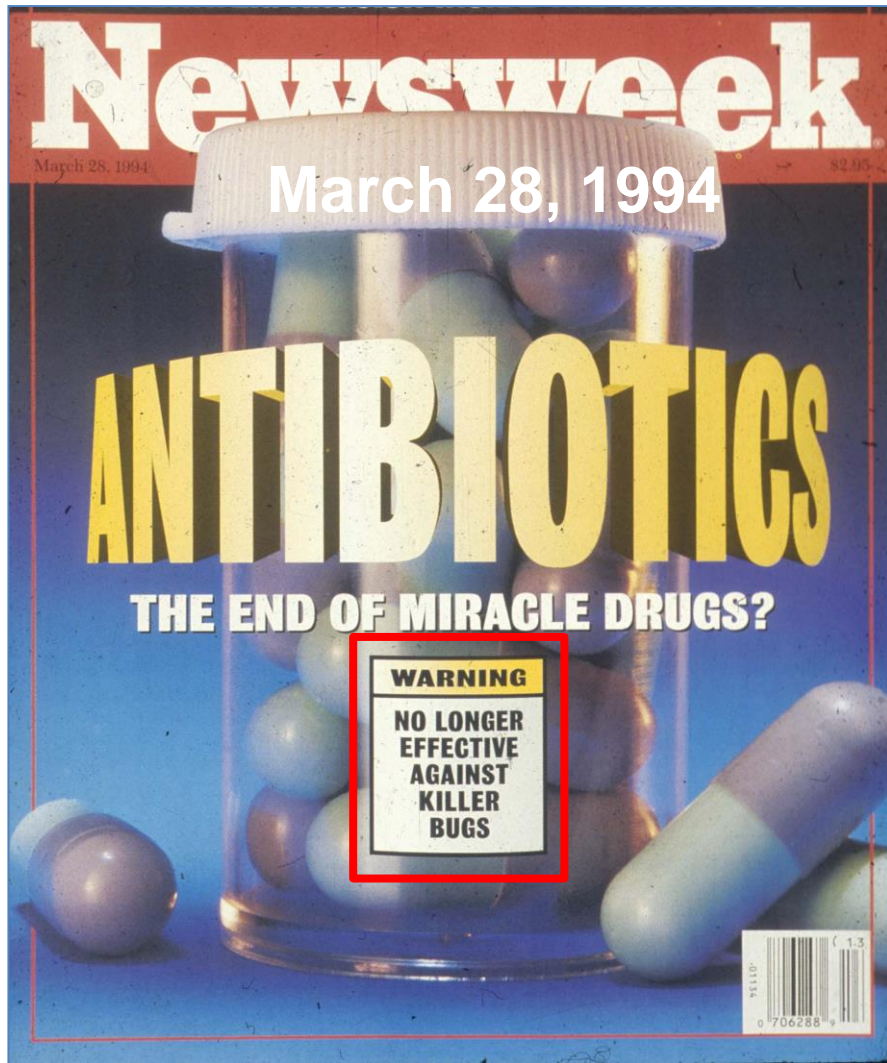
August 2015

Birth of Antimicrobial Stewardship

"Microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out…

In such cases, the thoughtless person playing with penicillin is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted."
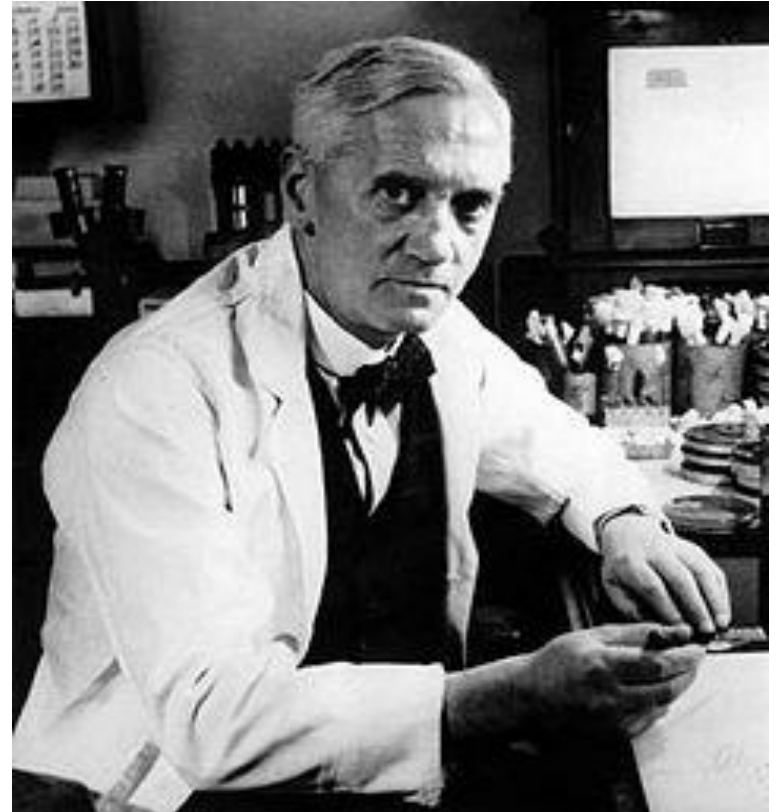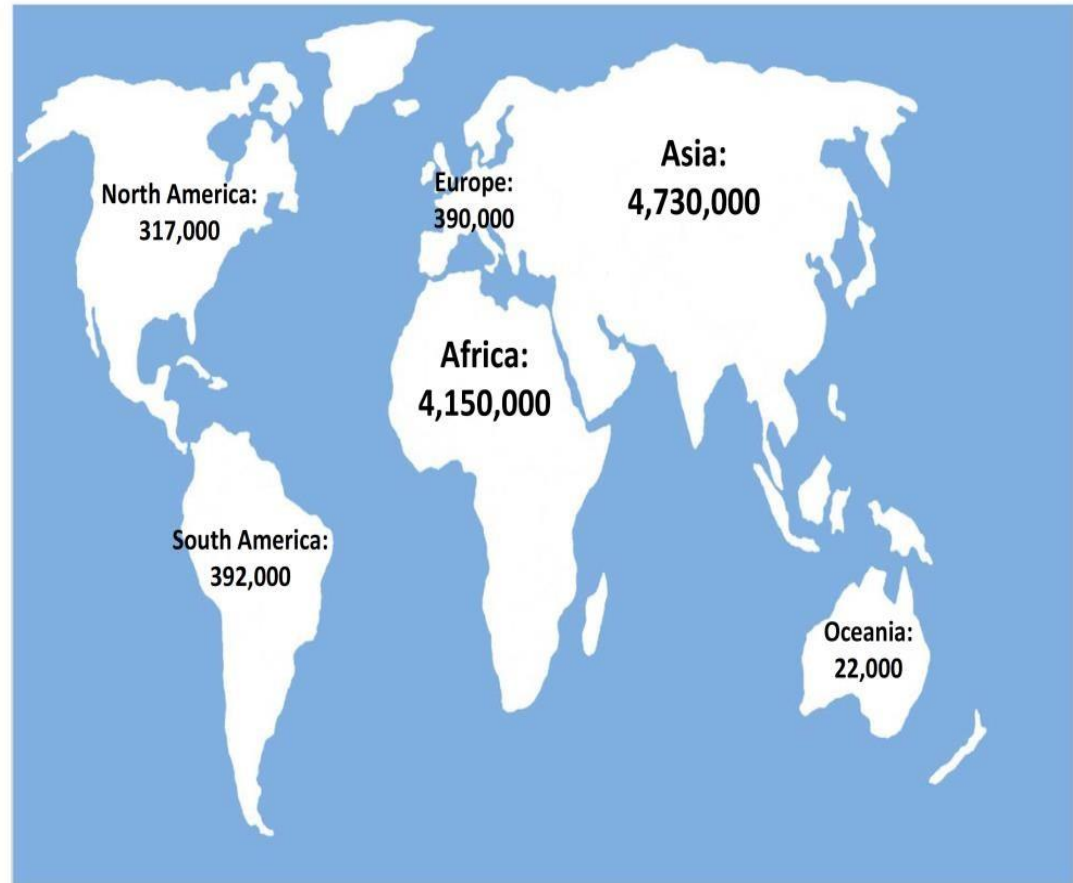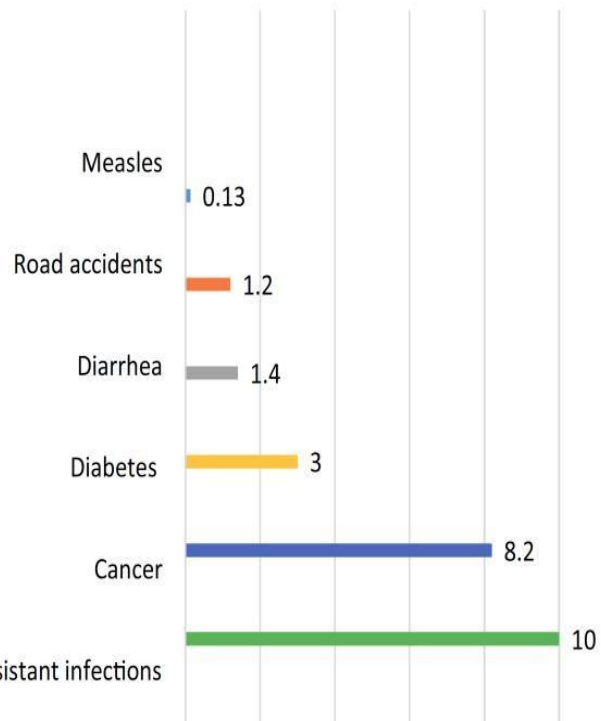
Fleming A. New York Times. 26 June 1945:21.

Without intervention…..by 2050

The impact of antimicrobial resistance in 2050

Death attributable to antimicrobial resistance every year by 2050 in different countries [1]

DEATHS PER ANNUM FOR ANTIMICROBIAL RESISTANT INFECTIONS AND OTHER CAUSES BY 2050 IN MILLIONS. [1] AND HTTP:// AMR-REVIEW.ORG/

Cause	Deaths (millions)
Measles	0.13
Road accidents	1.2
Diarrhea	1.4
Diabetes	3
Cancer	8.2
Antimicrobial resistant infections	10

North America: 317,000
Europe: 390,000
Asia: 4,730,000
Africa: 4,150,000
South America: 392,000
Oceania: 22,000

Bassetti M et al. Intensive Care Med. 2017 Jul 21. doi: 10.1007/s00134-017-4878-x

How has antimicrobial resistance developed?

- Antimicrobial resistance is a natural phenomenon

- Overuse, misuse and inappropriate use of antibiotics

- The delivery of more complex health care requiring longer use of antibiotics

- Prolonged hospitalisation

- The implications of surgical procedures undertaken overseas

- Resistant pathogens can now spread easily
  - during hospitalisation if infection prevention is poor
  - potential for cross-border transmission through increased travel.

Why target antimicrobials?

- 30% of hospitalized patients at any given time receive antimicrobials
- 1/3 – 1/2 are *inappropriate or unnecessary*
- Leads to
  - Antibiotic Resistance
  - Increased morbidity/mortality
  - Collateral damage, e.g., C. *difficile*
  - Increased costs
- *"Antimicrobial use is the key driver of resistance.* This selective pressure comes from a combination of overuse… and also from misuse."

    -WHO Global Strategy for Containment of Antimicrobial Resistance, 2000.
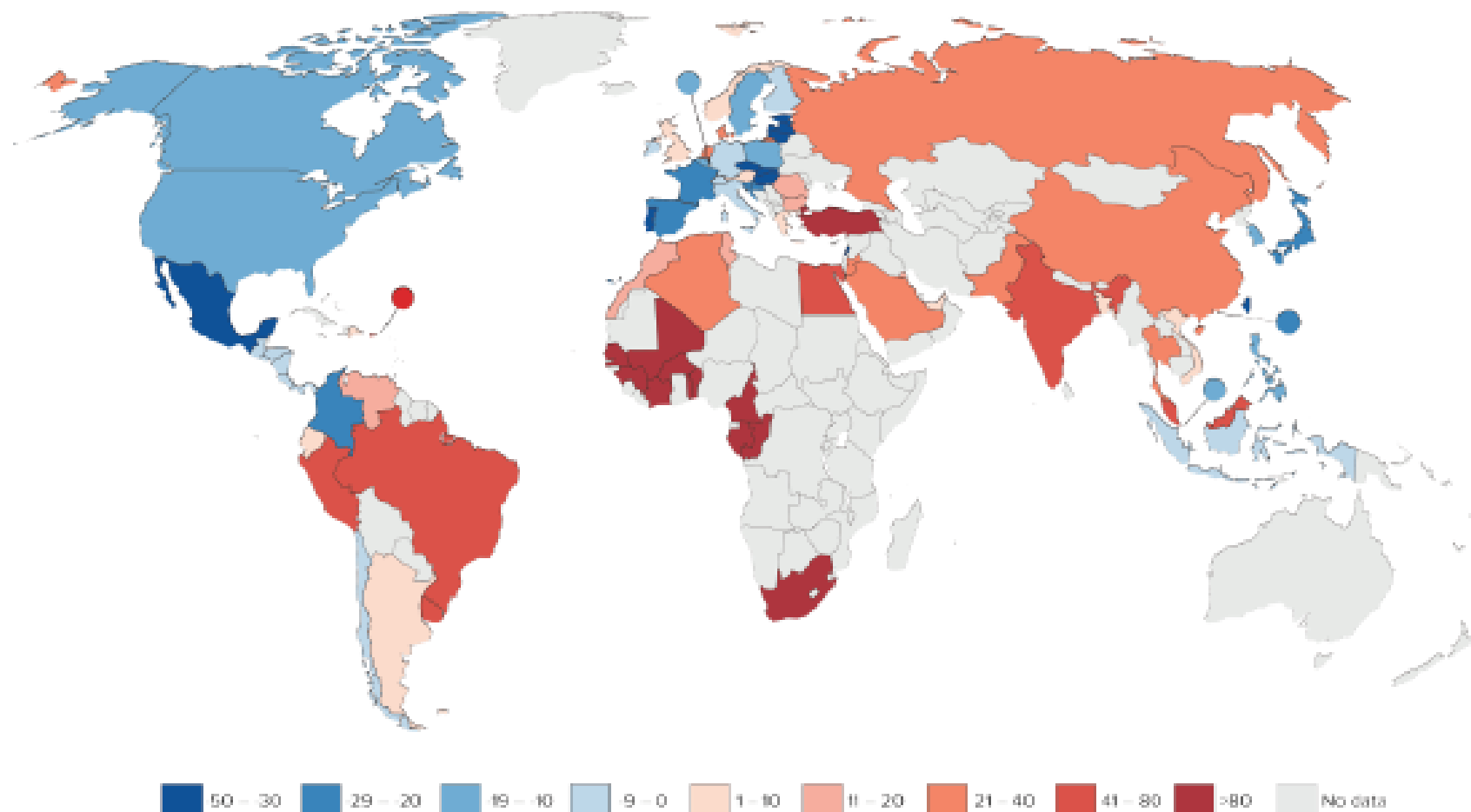
How ABX affect
Patients and Populations
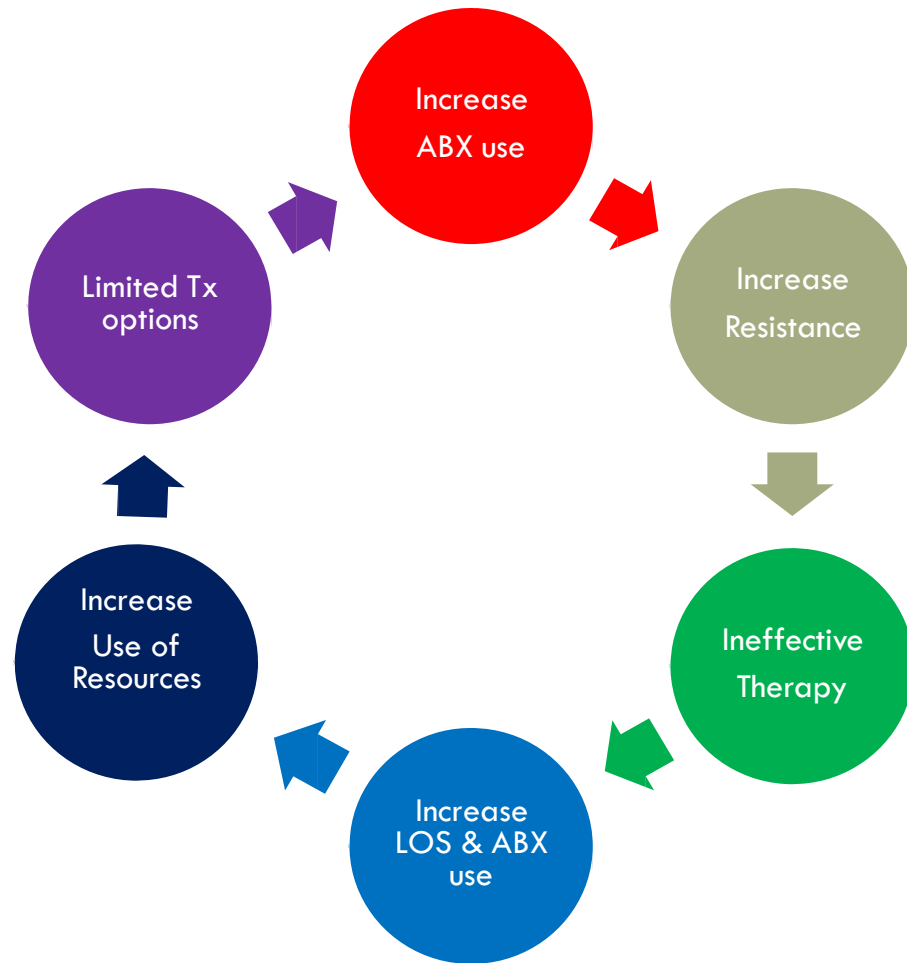
FIGURE 1

Percentage change in antibiotic consumption per capita 2000-2010

% patients prescribed ≥ 1 antimicrobial
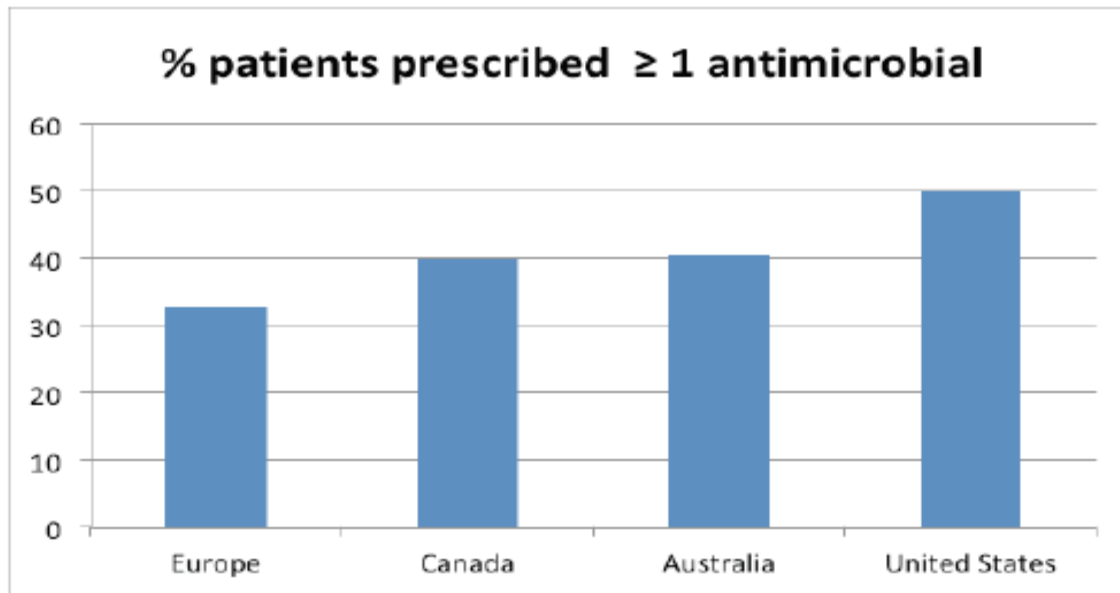
Europe – Mean 33%, Range 22 – 55%

FIGURE 5
Source: ECDC. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals 2011-2012

Taylor et al Can J Infect Dis Med Microbiol. 2015 Mar-Apr; 26(2): 85–89.

Magill et al JAMA 2014 vol. 312, no. 14, pp. 1438-1446

Antimicrobial prescribing practice in Australian hospitals. Results of 2015 National Prescribing Survey

Global increase and geographic convergence in antibiotic consumption between 2000 and 2015

Eili Y. Klein[a,b,c,1], Thomas P. Van Boeckel[d], Elena M. Martinez[a], Suraj Pant[a], Sumanth Gandra[a], Simon A. Levin[e,f,g,1], Herman Goossens[h], and Ramanan Laxminarayan[a,f,i]

[a]Center for Disease Dynamics, Economics & Policy, Washington, DC 20005; [b]Department of Emergency Medicine, Johns Hopkins School of Medicine,
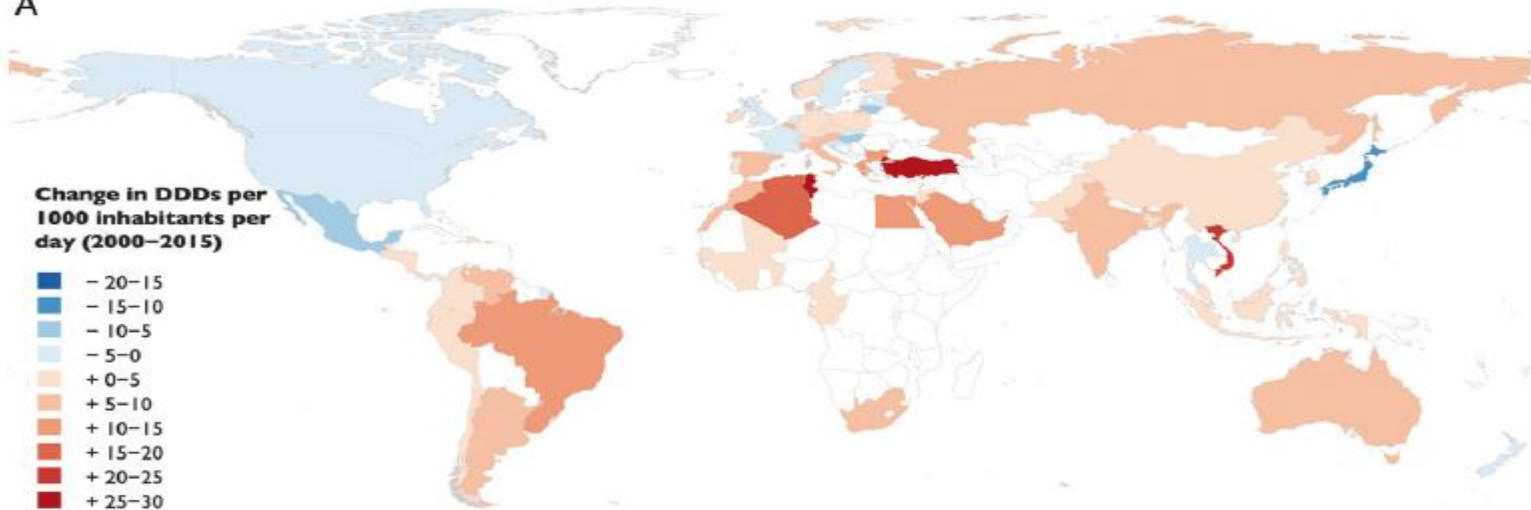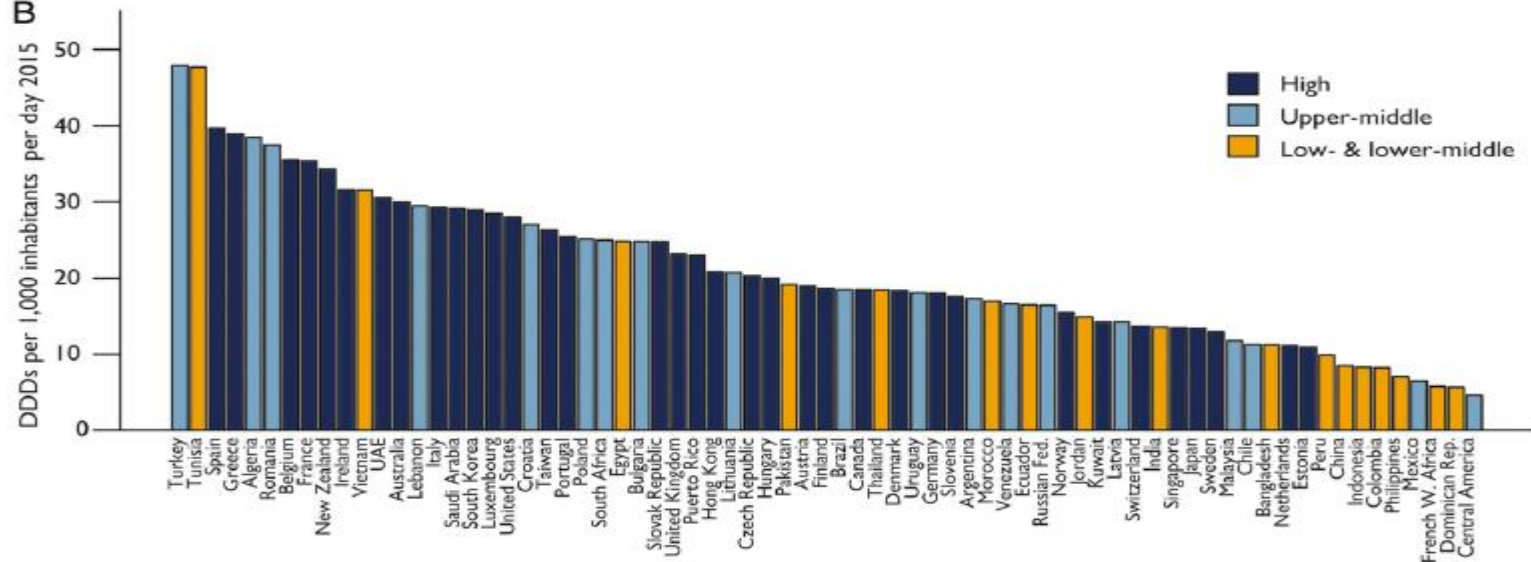
Estimates of Burden of Antibacterial Resistance

European Union
population 500m

25,000 deaths per year

2.5m extra hospital days

Overall societal costs
(€ 900 million, hosp. days)
Approx. €1.5 billion per year

Source: ECDC 2007

Thailand
population 70m

>38,000 deaths

>3.2m hospital days

Overall societal costs
US$ 84.6–202.8 mill. direct
>US$1.3 billion indirect

Source: Pumart et al 2012

United States
population 300m

>23,000 deaths

>2.0m illnesses

Overall societal costs
Up to $20 billion direct
Up to $35 billion indirect

Source: US CDC 2013

EXCESS COSTS ATTRIBUTABLE TO INFECTIONS WITH RESISTANT ORGAMISMS VS. INFECTIONS WITH SUSCEPTIBLE ORGANISMS

RESISTANT ORGANISM	CONTROL	RANGE OF EXCESS COST*
Methicillin-resistant *Staphylococcus aureus*	Methicillin-susceptible *S.aureus*	$695-$29 030 [21,22,24-36]
Vancomycin-resistant *Enterococcus*	Vancomycin-susceptible *Enterococcus*	$16 711-$60 988 [40-47]
Resistant *Pseudomonas aeruginosa*	Susceptible *P. aeruginosa*	$627-$45 256 [48-49]
Resistant *Acinetobacter baumannii*	Susceptible *A. baumannii*	$5336-$126 856 [23,50-52]
Multiple organisms	Susceptible	$9372-$18 990 [12,53,54]
ESBL-producing *Enterobacteriaceae*	Non-ESBL-producing *Enterobacteriaceae*	$3658-$4892 [56,57]

ESBL, extended-spectrum ß-lactamase.

* Includes both adjusted and unadjusted estimates; includes only studies reporting cost in US dollars.

FIGURE 7
Adapted from CMI 2014: 20:973-979

IMPACT OF ANTIMICROBIAL RESISTANCE ON STACKHOLDERS RELATED TO HEALTH

PATIENT, HOSPITAL AND CLINICIAN ALL ADVERSELY AFFECTED	PATIENT PAYS MORE. HOSPITALS LOSES ON REVENUE FROM NEW PATIENT	PATIENT / PAYER PAYS MORE. HOSPITALS SPENDS MORE ON ANTIBIOTICS

IMPACT OF ANTIBIOTIC RESISTANCE ON PATIENT MORTALITY, LENGTH OF HOSPITAL STAY

INFECTION AND CAUSATIVE ORGANISM	INCREASED RISK OF DEATH (OR)	ATTRIBUTABLE LENGHT OF STAY (DAYS)
MRSA bacteremia	1.9	2.2
MRSA surgical infection	3.4	2.6
VRE infection	2.1	6.2
Resistant *Pseudomonas aeruginosa* infection	1.8 - 5.4	5.7 - 6.5
Resistant *Enterobacter* infection	5.0	9.0
Resistant *Acinetobacter* infection	2.4 - 6.2	5 - 13
ESBL-producing or KPC-producing *Escherichia coli* or *Klebsiella* infection	3.6	1.6-fold increase

ESBL, extended-spectrum ß-lactamase; KPC, *Klebsiella pneumoniae* carbapenemase; MRSA, methicillin-resistant Staphylococcus aureus; OR, odds ratio; VRE, vancomycin-resistant enterococci.

OPTIMISE HEALTHCARE COSTS

Study	Intervention	Impact
Seligman SJ et al.	Restriction	Total reduction in antibiotic costs by 29%
Britton HL et al.	Clinical guidelines	Total purchases of cephalosporins decreased by $55,715 or 46.2%
Briceland LL et al.	De-escalation	Total cost savings of $38,920.95 during intervention period
Avorn J et al.	Clinical Pathway	Savings of $76,000 annually
McGregor JC et al.	Computerized monitoring software	Savings of 84,188 compared to control arm over 3 months

TABLE 2
Examples of documented cost savings associated with stewardship interventions
Source : https://www.cdc.gov/getsmart/healthcare/evidence/asp-int-costs.htm

Antibiotic resistance:
a problem globally…

2014: WHO Global Report on Surveillance
- Very high rates of resistance observed for common bacteria that cause healthcare associated and community-acquired infections in all WHO regions
- Significant gaps in surveillance
- Urgent need to strengthen collaboration on global surveillance to address antimicrobial resistance (AMR).

May 2015
- World health assembly endorses global action plan to tackle AMR.

September 2016
- 193 countries sign UN Declaration to take action on AMR, reaffirming their commitment to develop national action plans on AMR, based on the global action plan.
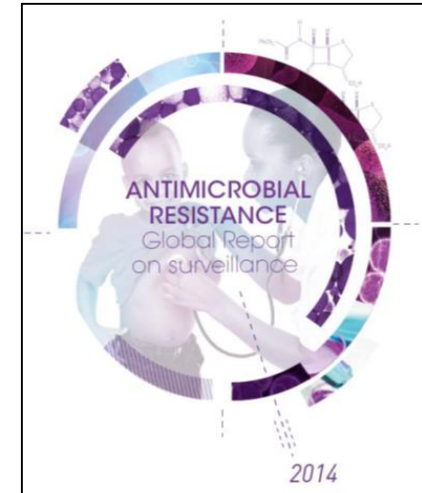
6. World Health Organization 2014 . Antimicrobial Resistance: Global Report on Surveillance.
http://www.who.int/drugresistance/documents/surveillancereport/en/ Last accessed 21/9/14
7. http://www.who.int/antimicrobial-resistance/global-action-plan/en/
8. http://www.who.int/mediacentre/news/releases/2016/commitment-antimicrobial-resistance/en/

Available National Data* on Resistance for Nine Selected Bacteria/Antibacterial Drug Combinations, 2013

Number of requested bacteria/ antibacterial medicine resistance combinations for which data was obtained:

- >5 (n=89)
- 2-5 (n=22)
- 1 (n=3)
- National data not available (n=15)
- No information obtained for this report, some centres participate in some ANSORP projects (n=2)
- No information obtained for this report, some centres participate in some RusNet projects (n=3)
- No information obtained for this report (n=60)
- Not applicable

0 875 1,750 3,500 Kilometers

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization

World Health Organization

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*National data means data obtained from official sources, but not that data necessarily are representative for the populationor country as a whole

AMR in the Eastern Mediterranean Region-GLASS 2017
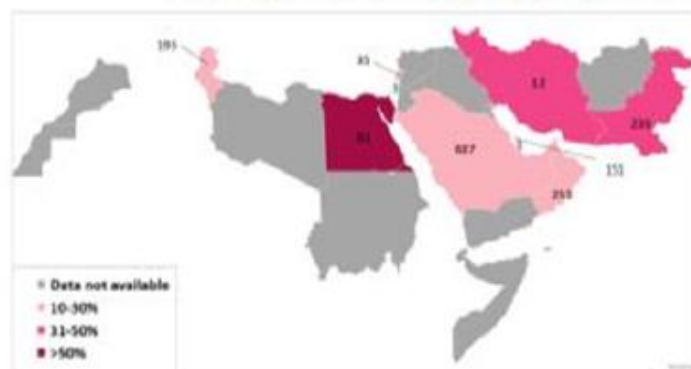
Carbapenem-resistant *Klebsiella pneumoniae* among blood isolates

Carbapenem-resistant *Acinetobacter baumannii* among blood isolates

Methicillin-resistant *Staphylococcus aureus* among Blood isolates

Colistin-resistant *Klebsiella pneumoniae* among blood isolates

Antibiotic Prescription Practices in EMR Countries

Pharmaceutical Sector Country Profiles 2014
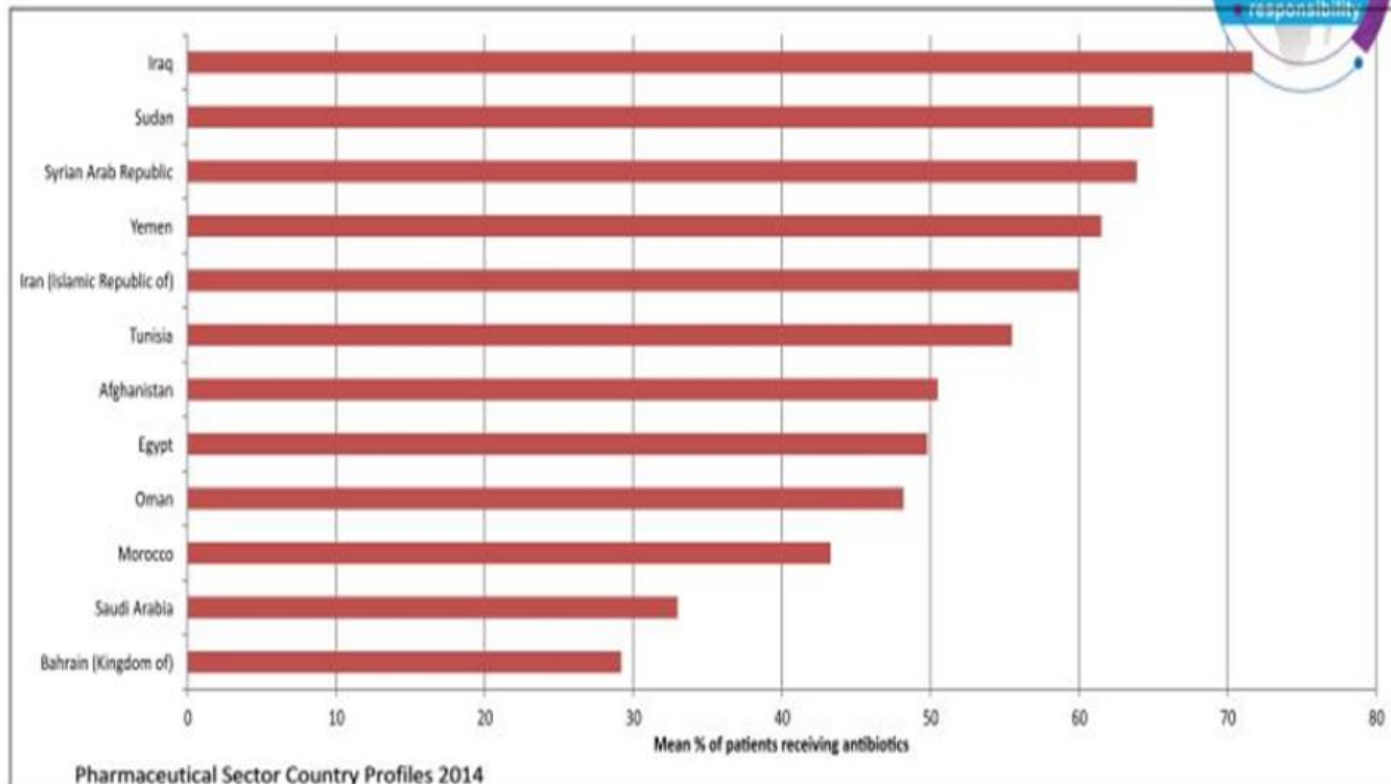
Limited research and Data

ANTIMICROBIAL RESISTANCE & INFECTION CONTROL

RESEARCH   **Open Access**

The prevalence of antimicrobial resistance in clinical isolates from Gulf Corporation Council countries

Mahmoud Aly[1] and Hanan H. Balkhy[1,2,3*]

CMR
Journals.ASM.org

β-Lactamase Production in Key Gram-Negative Pathogen Isolates from the Arabian Peninsula

Hosam M. Zowawi,[a,b] Hanan H. Balkhy,[b] Timothy R. Walsh,[a,c] David L. Paterson[a]

The University of Queensland, UQ Centre for Clinical Research, Herston, Queensland, Australia[a]; King Abdulaziz Medical City, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia[b]; Department of Infection, Immunity and Biochemistry, School of Medicine, Cardiff University, Cardiff, United Kingdom[c]

Molecular Characterization of Carbapenemase-Producing *Escherichia coli* and *Klebsiella pneumoniae* in the Countries of the Gulf Cooperation Council: Dominance of OXA-48 and NDM Producers

Hosam M. Zowawi,[a,b,c] Anna L. Sartor,[a] Hanan H. Balkhy,[b,c] Timothy R. Walsh,[a,d] Sameera M. Al Johani,[b,e] Reem Y. AlJindan,[f] Mubarak Alfaresi,[g,h] Emad Ibrahim,[i] Amina Al-Jardani,[j] Seif Al-Abri,[c,k] Jameela Al Salman,[c,l] Ali A. Dashti,[m] Abdullah H. Kutbi,[a,n] Sanmarié Schlebusch,[o,p] Hanna E. Sidjabat,[a] David L. Paterson[a]

The University of Queensland, UQ Centre for Clinical Research, Herston, Queensland, Australia[a]; King Abdulaziz Medical City, King Saud bin Abdulaziz University for Health

Molecular Epidemiology of Carbapenem-Resistant *Acinetobacter baumannii* Isolates in the Gulf Cooperation Council States: Dominance of OXA-23-Type Producers

Hosam M. Zowawi,[a,b,c] Anna L. Sartor,[a] Hanna E. Sidjabat,[a] Hanan H. Balkhy,[b,c,d] Timothy R. Walsh,[a,e] Sameera M. Al Johani,[b,f] Reem Y. AlJindan,[g] Mubarak Alfaresi,[h,i] Emad Ibrahim,[j] Amina Al-Jardani,[k] Jameela Al Salman,[l,c] Ali A. Dashti,[m] Khalid Johani,[n,o] David L. Paterson[a]

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Rates of central line—associated bloodstream infection in tertiary care hospitals in 3 Arabian gulf countries: 6-year surveillance study

6 main concepts for antibiotic use in critically ill patients

- Impact on bacterial resistance

- Risk stratification

- Combination

- Drug optimization

- De-escalation

- Duration

Make a habit of two things: to help; or at least to do no harm.

Hippocrates

BrainyQuote
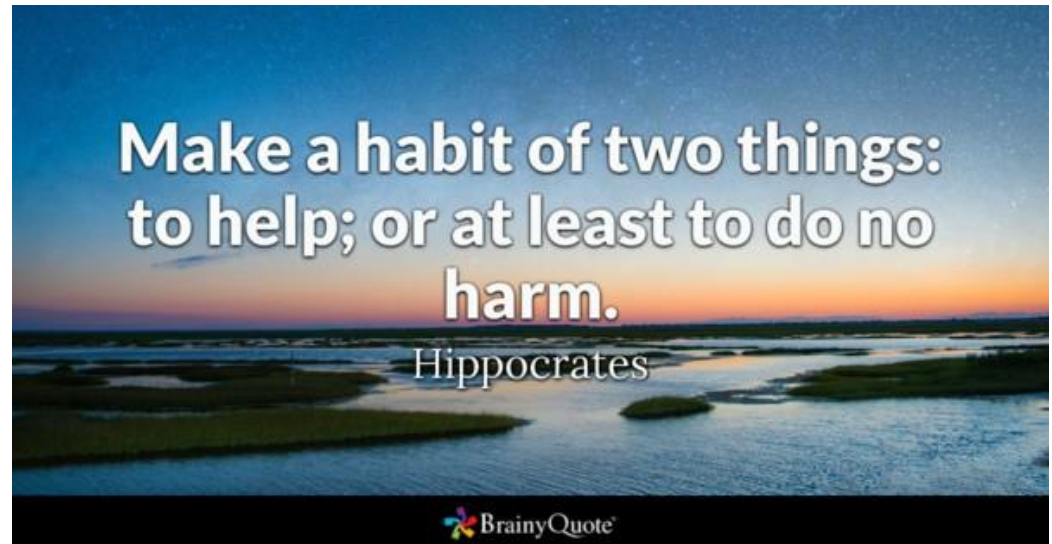
Misuse of antibiotics

Underuse
- An antibiotic is not used when it could improve health

Unnecessary use
- An antibiotic is not indicated e.g. non bacterial infections

Inappropriate use
- Incorrect timing, choice, dose, route, or duration

WHAT ARE THE DRIVERS FOR THE USE AND MISUSE OF ANTIBIOTICS?

OPTIMISE PATIENT SAFETY

IMPROVE CLINICAL OUTCOMES

CONTROL COSTS

PREVENT UNINTENDED CONSEQUENCES

REDUCE RESISTANCE, CDI, TOXICITY

BSAC : Antimicrobial stewardship from principals to practice
2018 British Society for Antimicrobial Chemotherapy
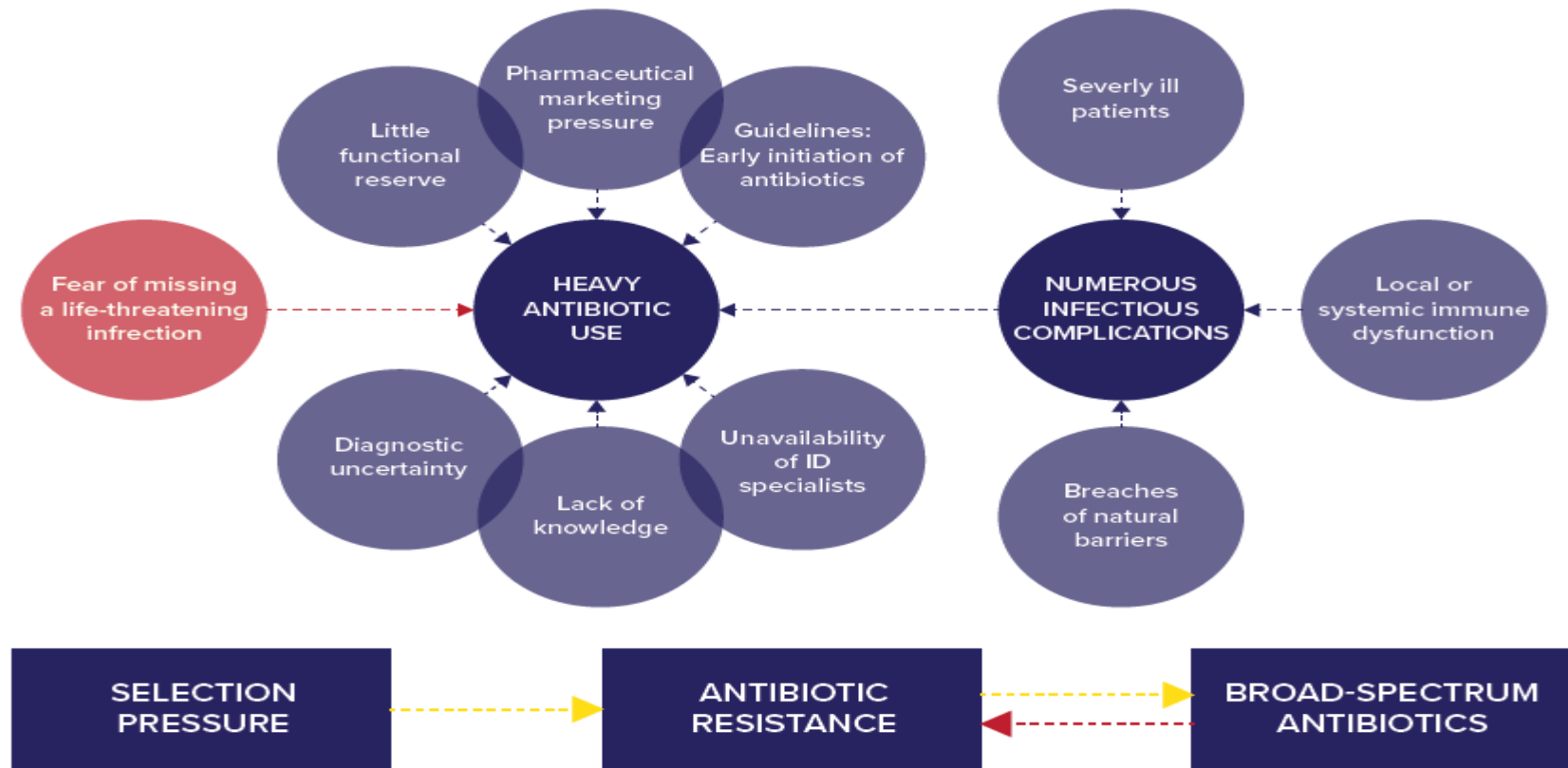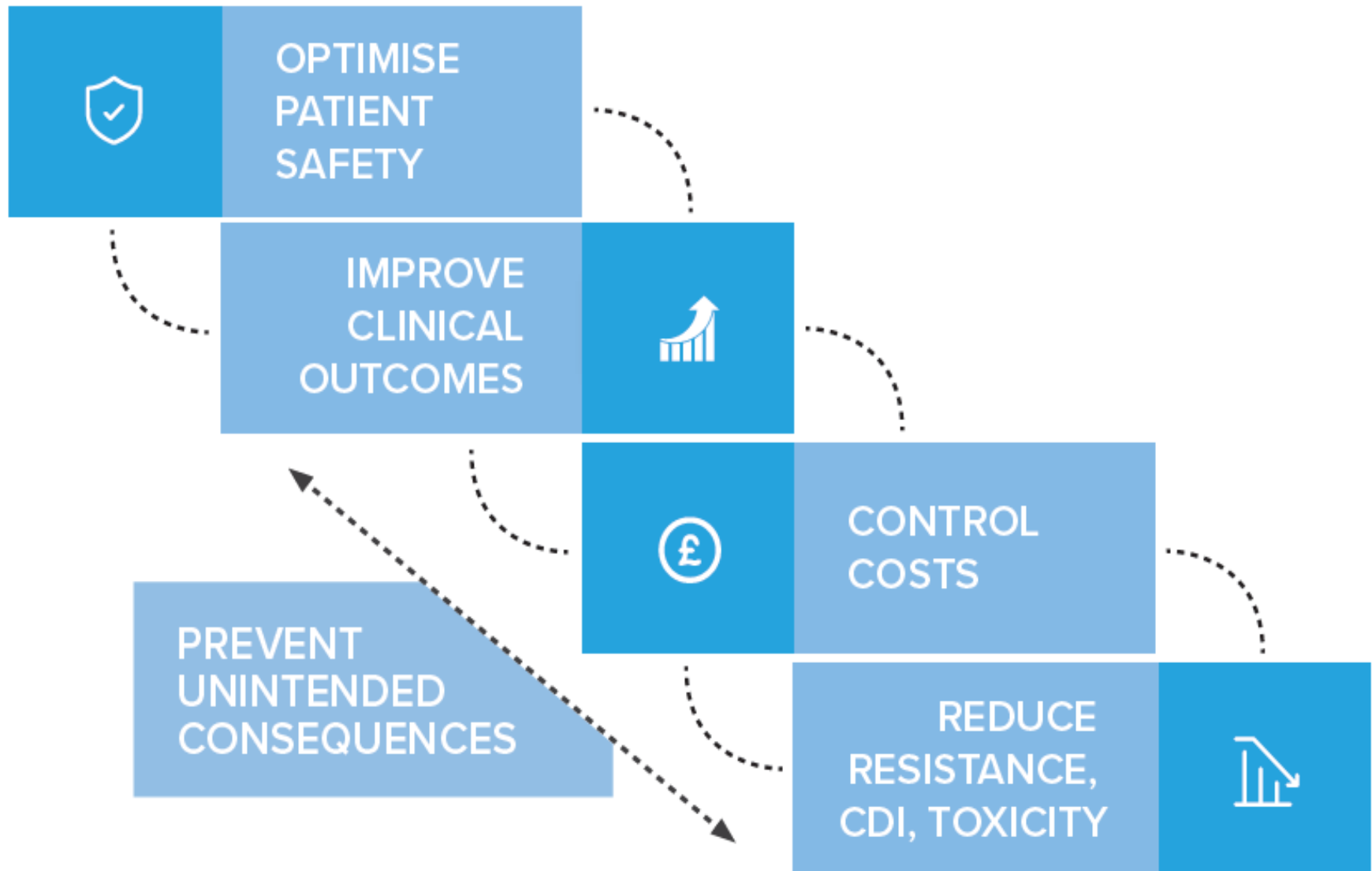
What are the Goals of Antimicrobial Stewardship?

- Antimicrobial stewardship is an organizational or healthcare system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness[1,2]

- Antimicrobial stewardship is a key strategy to overcome resistance by the careful and responsible management of antimicrobial use
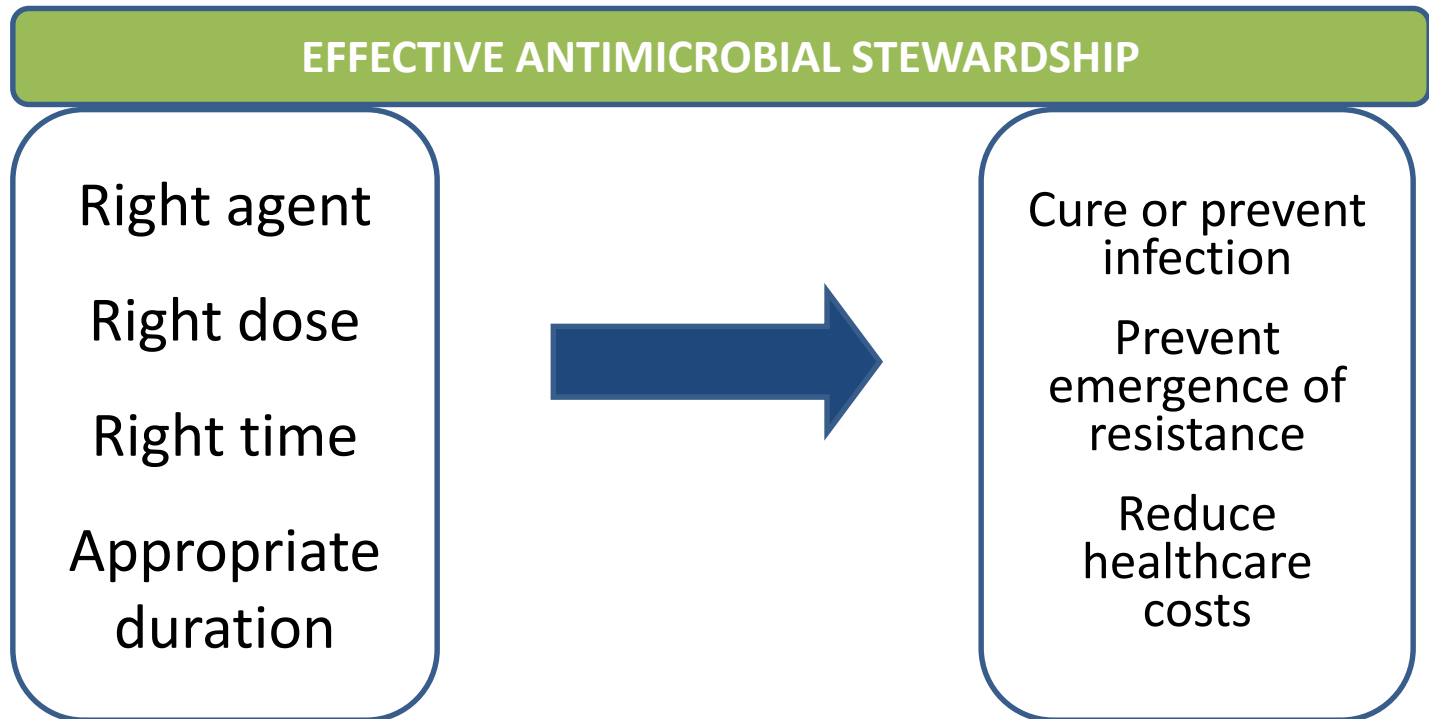
EFFECTIVE ANTIMICROBIAL STEWARDSHIP

Right agent

Right dose

Right time

Appropriate duration

→

Cure or prevent infection

Prevent emergence of resistance

Reduce healthcare costs

- **1.** British Society for Antimicrobial Chemotherapy. A Practical Guide to Antimicrobial Stewardship in Hospitals. Available at: http://bsac.org.uk/news/practical-guide-to-antimicrobial-stewardship-in-hospitals/. Last accessed September 29, 2015.

Key Components of an Antimicrobial Stewardship Program

- A multidisciplinary antimicrobial stewardship program should include:
  - Infectious diseases physician and pharmacist and other key stakeholders as determined by the institution
  - Policy statement
  - Physician-directed or supervised multidisciplinary program with a minimum of one or more members trained in antimicrobial stewardship

- **Two core strategies were recommended**
  - **Prospective audit with intervention and feedback**
  - **Formulary restriction and authorization**

- Other recommended strategies
  - Education
  - Guidelines and clinical pathways
  - Order forms
  - Streamlining/de-escalation
  - Dose optimization
  - Intravenous-to-oral conversion

- British Society for Antimicrobial Chemotherapy. *A Practical Guide to Antimicrobial Stewardship in Hospitals.* Available at: http://bsac.org.uk/news/practical-guide-to-antimicrobial-stewardship-in-hospitals/. Last accessed September 29, 2015.

"Definition" of *Improvement*

It is NOT…
yelling at people to work harder, faster, or safer
creating order sets or protocols and then failing to monitor their use or effect
traditional Quality Assurance

An Atmosphere for Change

AWARENESS	EXPERIENCE
OF THE LOCAL PERFORMANCE GAP	**WITH SIMILAR IMPROVEMENT EFFORTS**
Patient	Hospitalist Quality Officer
Medical Staff	Multidisciplinary Team Members
Administrative Support	Success Stories From Other Institutions
EVIDENCE	**WORKPLACE CULTURE**
TO TRANSLATE INTO PRACTICE	**READY TO ACCEPT CHANGE**
"Bedside" Teaching	Task Load
Didactic Teaching Sessions	Culture of Improvement
Local Expertise in Disease Literature	Culture of Negative Expectations

How best can we achieve these goals? The Challenge

- How to initiate and improve antibiotic stewardship efforts

- Proving that it works
  - Clinical outcomes
  - Decrease resistance

- Changing the antibiotic prescribing culture

- Hardwiring the process

- Continuing to show financial benefit to maintain funding and support of efforts

GUIDELINES

Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship

The Problem with Antimicrobial Stewardship

- Everyone thinks they know what it is

But who knows what it should be?

– Which strategies are most effective?

– How to assess their effectiveness?

Complex problem

Antimicrobial Stewardship Team

Multidisciplinary Team Approach to Optimizing Clinical Outcomes*

Hospital Epidemiologist

Hospital and Nurse Administration

Infectious Diseases

Infection Prevention

Director, Quality

ASP Directors
- Cl. Pharmacist
- **Physician Champion**

Medical Information Systems

Chairman, P&T Committee

Microbiology Laboratory

Clinical Pharmacy Specialists

Partners in Optimizing(**physicians**) Antimicrobial Use such as ED, hospitalists, intensivists and surgeons

Decentralized Pharmacy Specialist

Clin Infect Dis 2007;44:159-177.

*based on local resources

Infection Prevention and Epidemiology

CDC Antibiotic Treatment in Hospitals: Core Elements

1. **Leadership commitment**: Dedicate necessary human, financial, and IT resources

2. **Accountability**: Appoint a single leader responsible for program outcomes-this is usually a physician

3. **Drug expertise**: Appoint a single pharmacist leader to support improved prescribing

4. **Act**: Take at least one prescribing improvement action, such as "antibiotic timeout"

5. **Track**: Monitor prescribing and antibiotic resistance patterns

6. **Report**: Regularly report to interdisciplinary team the prescribing and resistance patterns, and steps to improve

7. **Educate**: Offer team education about antibiotic resistance and improving prescribing practice

Team success

"The ultimate difference between a company and its competition is, in fact, the ability to execute."

- Larry Bossidy

One size does not fit all

Crisis

Success strategy

Lori A. Pollack, MD, MPH;[1] Diamantis Plachouras, MD, PhD;[2] Ronda Sinkowitz-Cochran, MPH;[1] Heidi Gruhler, MPH;[1] Dominique L. Monnet, PharmD, PhD;[2] J. Todd Weber, MD;[1] Transatlantic Taskforce on Antimicrobial Resistance (TATFAR) Expert Panel on Stewardship Structure and Process Indicators

Core indicators - Infrastructure

1. Does your facility have a formal **antimicrobial stewardship programme** accountable for ensuring appropriate antimicrobial use?

2. Does your facility have a **formal organizational structure** responsible for antimicrobial stewardship (e.g., a multidisciplinary committee focused on appropriate antimicrobial use, pharmacy committee, patient safety committee or other relevant structure)?

3. Is an **antimicrobial stewardship team** available at your facility (e.g., greater than one staff member supporting clinical decisions to ensure appropriate antimicrobial use)?

4. Is there a **physician identified as a leader** for antimicrobial stewardship activities at your facility?

5. Is there a **pharmacist** responsible for ensuring appropriate antimicrobial use at your facility?

6. Does your facility provide any **salary support** for dedicated time for antimicrobial stewardship activities (e.g., percentage of full-time equivalent (FTE) for ensuring appropriate antimicrobial use)?

7. Does your facility have the **IT capability** to support the needs of the antimicrobial stewardship activities?

Core indicators - Policy and practice

8. Does your facility have **facility-specific treatment recommendations** based on local antimicrobial susceptibility to assist with antimicrobial selection for common clinical conditions?

9. Does your facility have a written policy that requires prescribers to **document an indication** in the medical record or during order entry for all antimicrobial prescriptions?

10. Is it routine practice for specified antimicrobial agents to be approved by a physician or pharmacist in your facility (e.g., **pre-authorization**)?

11. Is there a formal procedure for a physician, pharmacist, or other staff member to review the appropriateness of an antimicrobial at or after 48 hours from the initial order (**post-prescription review**)?

Implementing an Antibiotic Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America

Tamar F. Barlam,[1,a] Sara E. Cosgrove,[2,a] Lilian M. Abbo,[3] Conan MacDougall,[4] Audrey N. Schuetz,[5] Edward J. Septimus,[6] Arjun Srinivasan,[7] Timothy H. Dellit,[8] Yngve T. Falck-Ytter,[9] Neil O. Fishman,[10] Cindy W. Hamilton,[11] Timothy C. Jenkins,[12] Pamela A. Lipsett,[13] Preeti N. Malani,[14] Larissa S. May,[15] Gregory J. Moran,[16] Melinda M. Neuhauser,[17] Jason G. Newland,[18] Christopher A. Ohl,[19] Matthew H. Samore,[20] Susan K. Seo,[21] and Kavita K. Trivedi[22]

Goal of the 2016 guidelines

- Provide a guideline that diverse stakeholders find useful

- More detailed, <u>implementation-oriented</u> focus compared with prior guidelines

- Expand scope

  - e.g. pharmacologic optimization, the role of microbiology-relevant interventions, and metrics by which to assess programs

  - Reference special populations, settings

- Use the GRADE system to rank the guideline's recommendations and the level of evidence

Select Examples

- **Does the Use of Preauthorization and/or Prospective Audit and Feedback Interventions by ASPs Improve Antibiotic Utilization and Patient Outcomes**?
  We recommend preauthorization and/or prospective audit and feedback over no such interventions **(strong recommendation, moderate-quality evidence).**

- **Should ASPs Implement Interventions Designed to Reduce the Use of Antibiotics Associated With a High Risk of CDI?**
  We recommend antibiotic stewardship interventions designed to reduce the use of antibiotics associated with a high risk of CDI compared with no such intervention **(strong recommendation, moderate-quality evidence)**

- **Should ASPs Implement Interventions to Increase Use of Oral Antibiotics as a Strategy to Improve Outcomes or Decrease Costs?**
  We recommend ASPs implement programs to increase both appropriate use of oral antibiotics for initial therapy and the timely transition of patients from IV to oral antibiotics **(strong recommendation, moderate-quality evidence)**

- **Should ASPs Implement Interventions to Reduce Antibiotic Therapy to the Shortest Effective Duration?**
  We recommend that ASPs implement guidelines and strategies to reduce antibiotic therapy to the shortest effective duration **(strong recommendation, moderate-quality evidence)**

Select examples continued

- Should ASPs Develop and Implement Facility-Specific Clinical Practice Guidelines for Common Infectious Diseases Syndromes to Improve Antibiotic Utilization and Patient Outcomes?

    We suggest ASPs develop facility-specific clinical practice guidelines coupled with a dissemination and implementation strategy (**weak recommendation, low-quality evidence**)

- Should ASPs Advocate for Rapid Diagnostic Testing on Blood Specimens to Optimize Antibiotic Therapy and Improve Clinical Outcomes?

    We suggest rapid diagnostic testing in addition to conventional culture and routine reporting on blood specimens if combined with active ASP support and interpretation

    (**weak recommendation, moderate-quality evidence**)

Current evidence on hospital antimicrobial stewardship
objectives: a systematic review and meta-analysis

- Overall quality of evidence was low, but they concluded there was enough support for some interventions:
  - Following guidelines in administering empiric antibiotics
  - IV to PO
  - Antibiotic restrictions
  - ID consultations
  - therapeutic drug monitoring
  - De-escalation of therapy
- Conclusion: The overall evidence for these interventions shows significant benefits for clinical outcomes, adverse events, costs, resistance rates, or combinations of these. However, the included studies were generally of low quality.

Lancet Infect Dis 2016 published online March 2

So how to start

Summary of Core Elements of Hospital Antibiotic Stewardship Programs

- **Leadership Commitment:** Dedicating necessary human, financial and information technology resources.

- **Accountability:** Appointing a single leader responsible for program outcomes. Experience with successful programs show that a physician leader is effective.

- **Drug Expertise:** Appointing a single pharmacist leader responsible for working to improve antibiotic use.

- **Action:** Implementing at least one recommended action, such as systemic evaluation of ongoing treatment need after a set period of initial treatment (i.e. "antibiotic time out" after 48 hours).

- **Tracking:** Monitoring antibiotic prescribing and resistance patterns.

- **Reporting:** Regular reporting information on antibiotic use and resistance to doctors, nurses and relevant staff.

- **Education:** Educating clinicians about resistance and optimal prescribing.

Start with a Gap Analysis

Negotiate for dedicated and reimbursed effort for Stewardship MD and PharmD

Don't get overzealous and take time to observe the local culture

You need data resources

Learn how to make a financial argument

Watch for new CDC Core Elements November 2019

https://www.cdc.gov/antibiotic-use/core-elements/hospital.html

1 **COLLECT BASELINE DATA WITHIN THE ORGANISATION**
Antimicrobial use and expenditure trends over time
Local antimicrobial susceptibility data

2 **SURVEY THE AMS CULTURE WITHIN THE ORGANISATION**
Conduct a survey to determine the drivers for AMS within the organisation, e.g. AMR, HCAI, financial
Assess the level of support for the ASP available from the executive team
Identify committees with an interest in AMS, e.g Drug and Therapeutics Committee; define their responsibilities and develop a reporting structure

3 **ASSESS THE RESOURCES AVAILABLE**
Are there trained staff or staff willing to be trained in AMS?
- microbiology, ID, pharmacy, nursing
Do you have sufficent information technology resources to allow for easy surveillance?

4 **REVIEW EXISTING ANTIMICROBIAL GUIDELINES AND POLICIES**
Are they current, comprehensive, evidence based and tailored to local antibiograms?
Are they readily available at the point of prescribing?
Is there a named person responsible for content of guidelines and policies and their implementation?

5 **REVIEW COMMUNICATION WITHIN THE ORGANISATION**
What are the methods used to communicate with patients, medical, nursing and other staff?
How can these be utilised to provide communication around the ASP?

FIGURE 1
Proposed approach for implementing a successful ASP within an organisation

PROBLEM AREAS

- High resistance in key pathogens locally or nationally
- Poor knowledge of good antimicrobial stewardship within the organisation
- Critical incidents/patient safety issues
- High incidence of healthcare associated infections e.g. *Clostridium difficile* infection
- Expenditure - increasing costs
- Antibimicrobial consumption data - primary and secondary care
- Audit identifying poor practice
- Outlier when benchmarking with similar organisations

Complex patients, i.e. ICU

Areas with high antimicrobial use

Areas with high AMR rates

Areas with poor compliance to guidelines

Suggested priority areas for targeting ASP

Intervention	%
Antibiotic cycling programme	17
Restrictions on access by pharmaceutical representatives	33
Inflammatory markers to stop antibiotics early,	36
Inflammatory markers to prevent initiation of antibiotics,	39
Separate antimicrobial chart or section	39
Pre-authorized pharmacy-driven dose optimization	42
Automatic stop/review policy	46
Care bundles (e.g. ventilator)	64
Review of intravenous therapy at Day 3	76
Intravenous-to-oral switch guidance	80
Dose optimization on request	80
Systematic advice for bacteraemia by infectious	73
Infectious diseases/microbiology advice on ward rounds	81
Infectious diseases/microbiology advice by telephone	89
Reserve antibiotics needing authorisation by indication	84
Approved antibiotics (formulary)	90
Surgical prophylaxis guidelines	93
Treatment guidelines	94

Results of a global survey on types of AMS interventions employed as part of an ASP

Manpower

Essential Resources and Strategies for Antibiotic Stewardship Programs in the Acute Care Setting

Sarah B. Doernberg,[1] Lilian M. Abbo,[2] Steven D. Burdette,[3] Neil O. Fishman,[4] Edward L. Goodman,[5] Gary R. Kravitz,[6] James E. Leggett,[7] Rebekah W. Moehring,[8] Jason G. Newland,[9] Philip A. Robinson,[10] Emily S. Spivak,[11] Pranita D. Tamma,[12] and Henry F. Chambers[1]

Table 6. Minimal Full-time Equivalent Support Recommended by Bed Size

Variable	Bed Size			
	100–300	301–500	501–1000	>1000
Pharmacist	1.0	1.2	2.0	3.0
Physician	0.4	0.4	0.6	1.0
Total	1.4	1.6	2.6	4.0

For hospitals with <100 beds, there were limited data to make recommendations.

Communications

Actions and How We Communicate Matters ...

- Be Flexible and Show Your Face
- Don't Take Yourself Too Seriously
- Admit Mistakes
- Slow and Steady
- Participate in Day to Day Tasks if You're an MD
- Don't hide behind a computer or closed door

PROPOSED COMMUNICATION ROUTES

- Posters in clinical areas / staffrooms
- Use of hospital intranet
- Organisational newsletter
- AMS newsletter
- Hospital-wide email
- Notifications via electronic prescribing programme or app
- Discussion at relevant hospital committees
- Screensaver / background on computers within the organisation
- Email to divisional leads for dissemination in clinical areas
- Social media

Suggested communication routes which may be used within an ASP

```
                        CLEAR AIMS AND
                          OBJECTIVES
    OUTCOME             NEED TO BE                      CLEAR LINES OF
    MEASURES          DEFINED ALONG                   ACCOUNTABILITY
   SHOULD BE          WITH METRICS                      WITHIN THE
   REPORTED TO       FOR MEASURING                    ORGANISATION
   THE HOSPITAL         OUTCOMES
    EXECUTIVE
```

- **OUTCOME MEASURES SHOULD BE REPORTED TO THE HOSPITAL EXECUTIVE**
- **CLEAR AIMS AND OBJECTIVES NEED TO BE DEFINED ALONG WITH METRICS FOR MEASURING OUTCOMES**
- **CLEAR LINES OF ACCOUNTABILITY WITHIN THE ORGANISATION**
- **LINK TO OTHER RELEVANT COMMITTEES WITHIN THE ORGANISATION**
- **TOP TIPS FOR A SUCCESSFUL ASP**
- **RESOURCES DEDICATED TO AMS**
- **ASP IS INCLUDED IN THE ORGANISATION'S QUALITY AND SAFETY STRATEGIC PLAN**
- **ASP SHOULD REVIEWED REGULARLY**
- **A MULTIDISCIPLINARY ANTIMICROBIAL COMMITTEE SHOULD BE CREATED WITH TERMS OF REFERENCE DEFINED**

Top tips for a successful ASP

HOW DO I ASSESS THE EFFECTIVENESS OF AN ANTIMICROBIAL STEWARDSHIP PROGRAMME?

There are many ways to assess the effectiveness of an ASP, including:

• Audit of compliance with guidelines

• Audit documentation – e.g. indication, stop/review date, 48-72 hour review

• Audit time to 1st dose of antibiotic in sepsis

• Monitor antibiotic consumption data, including benchmarking to similar institutions

• Monitor antibiotic expenditure data

• Monitor stewardship interventions and acceptance rates

• Review adverse events in relation to antimicrobials

Defined outcome measures should be defined as part of an organizations ASP strategy.

Measurement

Clinical

- Length of stay
- Clinical cure/failure rates
- Readmission rates (30 days)
- Resistance rates
- Infection-related mortality
- *C. Difficile* infections

Process

- Dose optimization
- Adherence to hospital specific guidelines
- Appropriate de-escalation/streamlining
- Appropriateness of therapy
- Cultures before antibiotics

Outcomes

Humanistic

- Adverse drug events avoided
- Time to receipt of appropriate antimicrobials
- Duration of antimicrobial therapy
- IV/PO conversion rates
- Outpatient intravenous therapy rates

Economic

- Antimicrobial utilization (DDD or DOT)
- Hospital wide antimicrobial expenditures
- Relative consumption
- Rate of intravenous antimicrobial use
- Nonformulary agents avoided

DDD=Defined daily dose
DOT=Days of therapy

Suggested Measures

Measurement Area	Measure
Antibiotic consumption	• Days of therapy (DOT) per 1,000 patient days—overall and for specific agents or groups of agents • Defined daily dose (DDD) per 1,000 patient days (if DOT not available) • Standardized Antibiotic Administration Ratio*
Process measures	• Provision of indication with each antibiotic start • Percentage of cases where therapy is appropriate (especially for serious infections, such as sepsis) • Appropriate Treatment of Methicillin-Sensitive Staphylococcus aureus (MSSA) Bacteremia • Frequency at which de-escalation occurs • Timely cessation of antibiotics given for surgical prophylaxis • Antibiotics not prescribed to treat asymptomatic bacteria • Appropriate cultures obtained before starting antibiotics • Adherence to hospital-specific guidelines • Acceptance of ASP recommendations • Frequency of performance of antibiotic time outs or reviews • Timely administration of appropriate antibiotics in cases of suspected sepsis

Modified *Curr Infect Dis Rep* 2014; 16:433

Suggested Measures continued

Measurement Area	Measure
Outcome measures	• Length of stay • Cure of infection • Risk-adjusted mortality • Hospital readmissions for select infections • Hospital-onset C. difficile infections* • Adverse drug reactions (number/percentage/rate) • Antimicrobial resistance- focusing on hospital onset cases would most likely best reflect the impact of ASPs • Provider-level measures if available (e.g., treatment of *S. aureus* and bloodstream infections)
Financial	• Antibiotic cost per patient day • Antibiotic cost per admission • Total hospital cost per admission

'NQF-endorsed measure

Multiple metrics are not interchangeable.

Prescriptions per 1000 population per year

- Useful for monitoring trends

- Target public health interventions

DOTs per 1000 population per day

- Additional information for interventions

- Minimum effective duration

DDDs per 1000 population per day

- Estimate for international comparison

EVALUATION OF DRUG COST

Patient Charge — Hospital Cost PLUS insurance upcharge

Hospital Cost — Pharmacy Cost PLUS hospital overhead (staff, space, equipment etc.)

Average Wholesale Price (AWP) — AWP price approximates Pharmacy Cost

Pharmacy Cost — Drug purchasing cost PLUS overhead (staff, storage, space in pharmacy, etc.)

Drug Purchasing Cost — Actual purchase price paid by pharmacy, $/gram of drug

The Role of Pharmacists

#1
Patient care

#2
Educator

#3
Research

#4
Rapid diagnostic tests

#5
Drug therapy
expert

#6
Patient Safety

#7
Quality-care

#8
Advocacy

INVITED ARTICLE

IDSA
Infectious Diseases Society of America

hivma
hiv medicine association

OXFORD

The Critical Role of the Staff Nurse in Antimicrobial Stewardship—Unrecognized, but Already There

Richard N. Olans,[1] Rita D. Olans,[2] and Alfred DeMaria Jr[3]

- Allergy History
- Culture Acquisition
- Microbiology Results
- Antibiotic "Time Outs"
- Adverse Events
- Medication Reconciliation

- Drug Therapeutics
- IV to PO Transition
- Patient Education
- Provider Communication
- Device Management
- Preventing *C. difficile*

Diagnostic Stewardship

- Integral part of ASP:
  - Patient management guided by timely microbiological data to deliver safer and more effective and efficient patient care; and
  - Accurate and representative AMR surveillance data to inform treatment guidelines, and AMR control strategies

Figure 1: Relationship between individual care and surveillance data
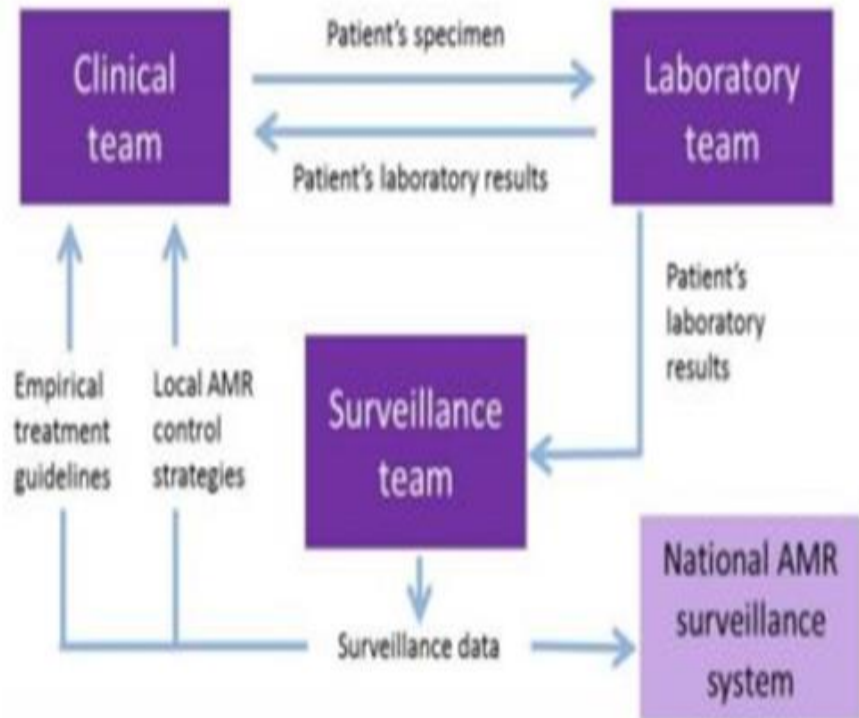
"Blind spot" of Stewardship: Antibiotic Overuse at Discharge

❑ What is driving this?

❑ What are the most common syndromes?

- UTI

- CAP

- SSTI

- *I would add bone/joint, endovascular (OPAT)*

❑ What guidelines/literature can serve as a roadmap?

❑ Practical strategies for improving antibiotic management at discharge?

SHEA

Original Article

Total duration of antimicrobial therapy resulting from inpatient hospitalization

April P. Dyer PharmD, MBA, MSCR[1,2] , Elizabeth Dodds Ashley PharmD, MHS[1,2], Deverick J. Anderson MD, MPH[1,2], Christina Sarubbi PharmD[1,4], Rebekah Wrenn PharmD[1,4], Lauri A. Hicks DO[3], Arjun Srinivasan MD[3] and Rebekah W. Moehring MD, MPH[1,2]

- Electronic data capture of post-discharge LOT from 3 hospitals

- >45K inpatient admissions, 51% received antimicrobials, **electronic discharge prescriptions 16%**

  - Post-discharge LOT median 8 days (1-360)

  - 38% of total exposure days

- *Challenge to capture all electronic discharge scripts and durations (esp. if system bypassed)*

Discharge Best Practices

✓ Establish institutional guidelines with evidence-based, shortest effective durations

➤ "shorter is better"

✓ Education

✓ Discharge audit/feedback

✓ Integrate data to capture both inpatient DOT and discharge prescriptions

✓ Document appropriately to reduce excess duration at d/c (especially ID consultants)

Continuum of Stewardship Activities in OPAT

1. Regimen selection
- IV Cefazolin 2g, 2g, 3g for invasive MSSA infection in a hemodialysis patient without other IV access

2. Therapeutic drug monitoring
- Weekly monitoring of vancomycin troughs with dose adjustment

4. IV to PO switch
- Use of outpatient PO clindamycin for MRSA osteomyelitis in a pediatric patient

5. Counseling
- Abx side effects
- Modifiable risk factors (hyperglycemia, smoking, obesity, etc.)

6. OPAT "time-out" = stopping Rx
- Clinical cure, OR
- Further antibiotics ineffective without amputation for gangrene

IV to PO – Benefits

- ↓ LOS[1, 3, 5, 6]

- ↑ early ambulation, patient comfort

- ↓ Antibiotic duration[1]

- ↓ 30-day readmission[1]

- ↓ *C. difficile* rates[1]

- ↓ Cost[2, 3, 6, 7]

- ↓ Incidence of line infections[4]

- ↓ Nursing workload

[1] Kurtzhalts KE et al. *Clin Ther* 2016;38:1750-8
[2] Davis S, et al. *Clin Infect Dis* 2005;41:1136-143
[3] Omidvari K et al. *Respir Med* 1998;91:1042-9
[4] Laing RB et al. *J Antimicrob Chemother* 1998;42:107-11
[5] Park SM et al. *Infect Chemother* 2017;31-7
[6] Kuti JL, et al. *Am J Health Syst Pharm* 2001;59:2209-15
[7] Paladino JA et al *Am J med* 1991;91:462-70

OVIVA – Results

Oral therapy was noninferior even in the "worst-case" scenario

Outcome of interest	IV	PO
Treatment failure within 1 year	14.6%	13.2%
Early discontinuation of treatment	99/523 (18.9%)	67/523 (12.8%)
Patient preference	3.6%	0.9%
Possible or probably recurrence	0.2%	2.8%
At least one serious adverse event	27.7%	26.2%
Antibiotic-related serious adverse event	13.6%	6.7%
C. difficile infection	1.7%	1%
Duration of therapy (median, days)	78	71
Hospital length of stay (median, days)	14	11
Oxford Knee Score	Improved patient-reported outcome P=0.04 at Day 120 and 365 favoring PO therapy	

And Maybe Now...

Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis (POET Study)

- **Can patients with left sided endocarditis be transitioned to oral antibiotics once stable?**

- Multicenter RCT in Denmark (400 patients)
- All patients received intravenous (iv) for 10 days
- 199 continue IV, 201 switch to oral
- <u>Outcome</u>: composite of all cause mortality, unplanned cardiac surgery, relapsed bacteremia, embolic events (follow-up 6 months after treatment)
- Micro: Streptococcus 49%, Enterococcus 22%, MSSA 22%, Other 7% (NO MRSA)

- Results: 24 (12.1%) IV group met primary outcome vs.18 (9.0%) oral group (95% CI, −3.4 to 9.6; P=0.40)

Iversen K, et al. N Engl J Med. 2019 Jan 31;380(5):415-424.

Any light at the end of the tunnel

The solution
What to do

Our work
Antibiotic management team

- It was started Since 2010 in SMC :

- MOH covers 80% of the health services in Bahrain

- Multidisciplinary team (we started with 3 members – reaching 16)

- The stakeholders:
  - Infectious diseases specialists
  - Microbiologist
  - Infectious disease and medical Residents
  - Pharmacy
  - Infection control
  - Administration:
  - The main amitotic committee
  - - other sub specialities : surgeon and general medicine as they will be the advocate for the best use of antibiotics

The process

- 1. Planning
- 2. Piloting
- 3. Dissemination
- 4. Monitoring : daily

Now covering :
1200 beds: number of inpatients seen 8000
28 health centers
7 other centers .

piloting
- One ward
- MICU / SICU
- Intermediate care unit

Increase coverage
- Medical wards
- 13 wards
- All the hospital

Primary care and others
- 25 health centers
- Other centers

Going national

2011-2013   2013-2016   2016-now
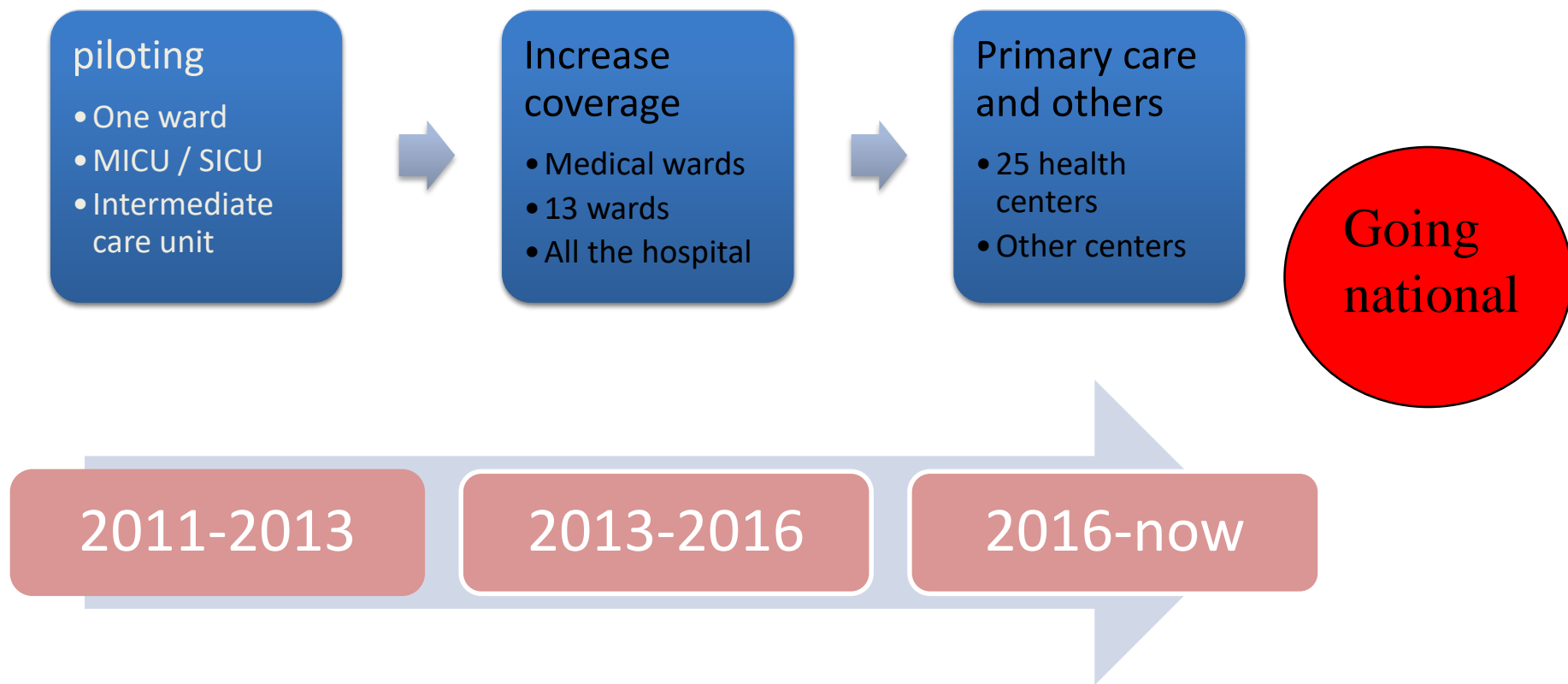
Sustainability
The most important outcomes and results:
1. education and awareness

- 1. large number of educational session , workshops structured for each category
- Special training for each category
  Different levels and languages (a lot of requests)
  - Secondary care
  - Primary care: The proper Utilization of Antibiotic in outpatient settings
  - Allied health
  - Pharmacists
  - Public :
- 2. two major conference in the filed of infectious disease
- 3. educational materials

2. The forms

Ministry of Health
Antibiotic Management Program
Date of Admission: 1/2/15
Chronic Medical Problems
MVR / AF / HF / HTN

Microbiology:-

Type of Culture	Date
Blood ×2	3/2
Stool	3/2
Nasopharyngeal	1/2

Antibiotic	Dose	Start Date
Meropenem	1g tds	1/2/2015
Klacid	500 bd	1/2/2015
Tamiflu	150 bd	1/2/2015

Date	Recommendation
8/2	

Kingdom of Bahrain
Ministry Of Health
Salmaniya Medical Complex
Antibiotics Approval Form

CPR: _____ Date: _____
Name: _____
Sex: _____ Ward: _____
Age: _____ Nat: _____
(Affix patient identification sticker here)

The Antibiotics that need approval

Name	1-	2-	3-	4-
Dose				
Route of administration (Oral – I.V – I.M)				
Duration				
Justification				

Recent Culture & sensitivity result

Blood		DTA	
Urine		OTHERS	

Dose the patient need more than 7 day antibiotics? If yes, Justify	
Dose the patient on more than 3 antibiotics? If yes Justify	

Attending physician	Name	
	Signature	
	Date	

ID Approval	Approved	Yes ☐ NO ☐ Justification:
	Needs of follow-up	Yes ☐ NO ☐
	Recommendations	

3. The number of the researches in the field
First stage : the evaluation of the situation

Patterns of antibiotic prescripti
and appropriateness in
emergency room in a m
secondary care hospital in Bah

Clinical Research

Appropriateness of Antibiotic Prescription for Upper Respiratory Tract Infections in Emergency Department in Bahrain

Jan
Fat

Antibiotic Appropriateness for Urinary Tract Infection in the Emergency Room

Jameela Al Salman, American Board* Sughra Sayed Alawi, Arab Board, MD**
Ebtihal Yusuf Alyusuf, Arab Board, MD***

Background: Urinary Tract Infections (UTI) are a common cause of emergency room (ER) visits and antibiotic misuse.

Objective: To evaluate the characteristics of UTI attending ER and to assess antibiotic prescription and inappropriate treatment implications.

Design: A Prospective Study.

Setting: Salmaniya Medical Complex, Bahrain.

Method: Patients aged more than 14 years who presented to the ER with UTI from 1 July 2014 to 31 July 2014 were reviewed. Data was obtained from patients' emergency records and classified according to the type of UTI as complicated, uncomplicated or UTI in pregnancy. Antibiotic treatment was considered appropriate if it followed the Local or International Guidelines.

Result: A total of 239 patients were included in the study; 83 (34.7%) were males, 75 (31.4%) were pregnant females and 81 (33.9%) were non-pregnant females, the mean age was 37.56 years. One hundred forty-five (60.7%) patients had complicated UTI. The most prescribed antibiotics were cefuroxime and ciprofloxacin. Seventy-two (30.1%) of inappropriate antibiotics prescription were mostly due to improper duration.

Inappropriate antibiotic treatment was significantly more common among males, 43 (17.9%) P-value <0.001; complicated UTI were 63 (26.4%), P-value <0.001. One hundred thirty-three (55.6%) prescriptions were written by emergency doctors, P- value <0.001. There was no

Trends of Empiric Antibiotic Usage in an Accident and Emergency Department in a Secondary Care Hospital

Jameela Al Salman, MD* Aysha Husain, MD** Muneer Mahdi, MD**

Background: Several strategies to optimize the use of antibiotics have been developed. Most of these interventions can be classified as educational or restrictive. Restrictive measures are considered to be more effective, but the enforcement of these measures may be difficult and may lead to conflicts with prescribers. Any intervention should be aimed at targets with the highest impact on antibiotic prescribing[1].

Objective: To evaluate the current practices of prescribing antibiotics at the time of admission and to assess the adequacy of empiric antibiotic use and to identify risk factors for inadequate treatment and targets for intervention.

Design: A prospective observational study.

Setting: Salmaniya Medical Complex.

Method: From November 2007 to March 2008, patients admitted in the medical department through the emergency and who received antibiotic therapy within 24 hours were included. Antibiotic therapy was considered adequate if the spectrum of coverage, dose, application mode and duration of therapy were appropriate according to local recommendations or published international guidelines.

Infection among renal transplant patients in the Kingdom of Bahrain: A ten year retrospective study (2004-2014)

Jameela Al Salman[1],
Rawan Al Agha[2],
Amani Al Arrayedh[2],
D Ahmed Radhi[2],
Maraym Al Alawi[2],
Abeer Khalaf[2],
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1 Infectious Disease Consultant,
Chairperson of Internal Medicine
Department, Salmaniya Medical
Complex, Manama/ Bahrain P.O.
Box 12
2 Resident in Internal Medicine

Abstract

Objective: Kidney transplantation can be associated with complications encountered during or after operation. Graft survival

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Antibiotics Surveillance in Pediatrics In-Patients, a Point Prevalence Comparative Study between Kingdom of Bahrain and the European Union

Jameela Al Salman, MD* Rawan Al Agha, MD**

ABSTRACT

Objective: To determine the variation in drug, dose and indications of antimicrobial prescription in children admitted in the hospital and compare the results with the European countries.

Design: Point Prevalence Survey (PPS)

HSOA Journal of Infectious and Non Infectious Diseases

Research Article

Community Acquired Pneumonia in the Kingdom of Bahrain

Jameela Al Salman[1]*, Rawan Al Agha[2], Zainab Al Tajer[2], Fatema Ali[2], Hind Al Junaid[2] and Maryam Omran[2]

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Keywords: Antibiotics; Infections; Pneumonia

Introduction

Community Acquired Pneumonia (CAP) is infection of the lung parenchyma acquired in the community in contrast to hospital acquired infection and a third group known as health care associated pneumonia. CAP is a leading cause of mortality and morbidity in the community particularly in elderly population, those with multiple co-morbidities and immunocompromised [1]. It affects 450 million people globally per year and results in 4 million deaths yearly [2]. The advances in antibiotic therapy and vaccines has improved survival in the 20th century after being regarded the "the captain of men death" in the 19th century [2]. The approach to patients with suspecting CAP begins with clinical evaluation combined with chest radiograph. The presence of a consolidation of or an infiltrate on any form of chest imaging is considered the gold standard in diagnosing pneumonia with the support of clinical evaluation and microbiological investigation(s) [1]. Pneumonia is caused mostly by bacteria and viruses and less commonly by fungal and parasite. Many strains are identified, but only few which are mainly responsible for the majority of the cases. In addition, mixed infection with bacteria and viruses are identified in 45% in children and 15% in adults. Approximately more than 50% of cases no

Abstract

Community acquired pneumonia is a major health problem, it has always been. It is one of the major causes for mortality and morbidity among all age groups. A retrospective study done in the Kingdom of Bahrain about the incidence, type of pathogens, treatment and outcome of patients admitted between the periods of 1st of October 2013 till the 31st of March 2014 with the admission diagnosis of pneumonia. A total 159 patients were enrolled without any

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Jacobs Journal of Emergency Medicine

of Antibiotic Prescription for Upper Respiratory Tract Infections artment in Bahrain

dija Farookh[e], Sughra Alawi[e], Ebtihal Alyusuf[e], Eman Albasri[e], Shurooq Almarzooq[e],
ahmed[e], Zahra Ali[e], Rawdha Fardan[e], Khatoon Alzaimoor[e]

nt, Chairperson of Internal Medicine Department, Salmaniya Medical Complex, Bahrain
icine, Salmaniya Medical Complex, Bahrain

ameela Al Salman, Infectious Disease Consulsatnt, Chairperson of Internal Medicine Department,
postbox, 32530, ISA town, Bahrain, Tel: +973 36515138; Email: jsalman@health.gov.bh;

4. Revision of all the antibiotics and the drug formulary

F49 | fx | 15000

Saving after Quantity Revision of antimicrobial items requested to be purchased in 2016 tenders

Item Code	Item Description	UOM	Item Status	Tender #	Original Qty	Decided to be purchased	Price	Total Saving in BD
22C20-40-00041	AMIKACIN SULPHATE 500 MG. I.M.I.V.	VIA	Active	SGH-38-2016	2000	250	0.2268	396.9
22C20-40-00043	AMOXYCILLIN & CLAVULINIC ACID 1.2	VIA	Active	SGH-38-2016	20000	10000	0.5292	5292
22C20-40-00045	AMPHOTERICIN B LIPID FORMULATED	VIA	Active	SGH-38-2016	600	0	64.77408	38864.448
22C20-40-00048	AMPICILLIN 0.5GM./VIAL	VIA	Active	SGH-38-2016	15000	15000	0.10206	0
22C20-40-00057	ANIDULFUNGU 100MG VIAL	VIA	Verify	SGH-38-2016	2340	850	68.04	101379.6
22C20-40-00090	AZITHROMYCIN 500MG VIAL	VIA	Active	SGH-38-2016	500	0	4.4004114	2200.2057

	Item Code	Item Description		Item Status	Tender #	Original Qty	Decided	Price	Total Saving
76	22C20-80-02445	RIFAXIMIN 200MG	TAB	Verify	MOH-19-2016	4000	1668	2.583	6023.556
77	22C20-80-02557	SPIRAMYCIN 1GM TABLETS	TAB	Verify	MOH-19-2016	500	0	0.4	200
78	22C20-80-03205	zidovudine300mg+Lamivudin 150 mg ()			MOH-19-2016	50,000	20000	2.4500	73500
79	22C20-80-01503	LAPATINIB 250 MG			SGH-38-2016	10,000	10000	8.77678	0
80	22C20-80-02872	Valganciclovir 450 mg			SGH-38-2016	4,000	2700	11.15100	14496.3
81	22C20-40-00372	Ciprofloxacin IV inj 200 mg			SGH-38-2016	10,000	7000	0.32130	963.9
82	22C20-80-01530	LINEZOLID (ZYVOX) 600MG			SGH-38-2016	2,000	1000	26.46000	
83				Total Saving					2,220,913.45
84									
85									
86				Saving from Order in the pipline requested to be cancelled					

	Item Code	Item Description	Recommendation	saving in BD
87				
88	22C20-80-00343	CEFUROXIME Axetil 500 MG	to cancel LPO # 22159275 & LPO #22159276	77,600.00
89	22C20-80-00098	AMoxil Clavulanic acid 875/125 n	to cancel 22159477	22,302.00
90	22C20-30-01825	Tobramycin 300mg/5ml	to cancel th LPO 22159869	35,723.00
91	22c20-40-02390	Vancomycin inj 500 mg	to cancel LPO #22159772	61,538.40
92	22C20-40-01350	LINEZOLID (ZYVOX) 600MG IV	ncel order # 22160524 & postpone oreder # 221605.	66,150.00
93			Total	263,313.40

5.Antibiotic Guidelines

Ministry of Health

Kingdom of Bahrain

Ministry OF Health

Salmaniya Medical Complex

Antimicrobial Guidelines

Second Edition

2016

Prepared, Reviewed and approved by: The Antibiotic committee

December 2016,

Ministry of health

The guidelines were developed based on the international guidelines and/or local expert opinions

6. The software

		Product name	Grams per unit dose	Nr of unit doses per package	Name of Antibactrial	ATC code	Adm Route	DDD (WHO 2006) U
	J01A - Tetracycline				Doxycyline	J01AA02	IV	0 gm
	J01CA - Penicillin with extended spectrum		0.5	50	Ampicillin	J01CA01	IV	2 gm
J01C - Beta lactam penicillin					Amoxicillin	J01CA04	IV	1 gm
			4	12	Pipercillin	J01CA12	IV	14 gm
	J01CF - Betalactam resistent penicillin				Dicloxacillin	J01CF01	IV	2 gm
			0.25	5	Cloxacillin	J01CF02	IV	2 gm
	J01CE - Beta lactam sensitive penicillin		0.5	50	Benzyl Penicillin	J01CE01	IV	4 gm
	J01DC - 2nd Generation Cephalosporins		0.75	5	Cefuroxime	J01DC02	IV	3 gm
J01D - Other beta lactam Antibiotics	J01DD - 3rd Generation Cephalosporins		0.5	5	Ceftazidime	J01DD02	IV	4 gm
			2	5	Ceftriaxone	J01DD04	IV	2 gm
	J01DE - 4th Generation cephalosporins		0.5	1	Cefepime	J01DE01	IV	2 gm
	J01DH - Carbapenems		1	10	Meropenem	J01DH02	IV	2 gm
			0.5	10	Imipenem	J01DH51	IV	2 gm
	J01FA - Macrolides		0.5	1	Erythromycin	J01FA01	IV	1 gm
J01F - Macrolides and Lincosamides					Clarithromycin	J01FA09	IV	1 gm
			0.5	5	Azithromycin	J01FA10	IV	1 gm
	J01FF - Lincosamides		0.6	10	Clindamycin	J01FF01	IV	2 gm
	J01G - Aminoglycosides		0.12	10	Gentamicin	J01GB03	IV	0 gm
					Amikacin	J01GB06	IV	1 gm
					Ofloxacin	J01MA01	IV	0 gm
J01M - Quinolone antibiotics	J01MA - Fluoroquinolone		0.4	5	Ciprofloxacin	J01MA02	IV	1 gm
			0.5	5	Levofloxacin	J01MA12	IV	1 gm
			0.4	1	Moxifloxacin	J01MA14	IV	0 gm
	J01XA - Glycoprotein		1	1	Vancomycin	J01XA01	IV	2 gm
J01X - Others Antibiotics	J01XB - Polymixins		0.15	10	Colistin	J01XB01	IV	3 MU
	J01XD - Imidazole		0.5	1	Metronidazole	J01XD01	IV	2 gm
	J01XX - Others		0.6	10	Linezolid	J01XX08	IV	1 gm

Row Labels	Sum of SumOfTotal Cost
Amoxicillin	496.98
2014	70.28
2015	136.795
2016	289.905
Ampicillin	22.1616
2014	22.1616
Azithromycin	151.8
2013	101.2
2015	50.6
Cefepime	
2014	
2015	
2016	
Ceftazidime	972.1008
2013	50.8288
2014	120.7184
2015	641.7136
2016	158.84
Ceftriaxone	4810.05
2013	366.66
2014	1209.6
2015	1888.11
2016	1345.68
Cefuroxime	85.4084
2014	41.7956
2016	43.6128
Ciprofloxacin	6405.3462
2013	629.0174
2014	3224.8216
2015	629.0174
2016	1922.4898
Clarithromycin	11597.1768

7. Electronic health system

⚠ New

(amoxicillin 875 mg) + (clavulanic acid 125 mg) tablet

☐ STAT Once only

Route [Oral ▾]   ☐ Dose per Weight

☐ Depending on clinical condition

Dose ⦿ Fixed ○ Variable

Dose	Frequency	Duration	Start of treatment
1 tablet	every ▾ 12 hours ▾	7 days ▾	Normal ▾

[Prescribe new line]

The prescribing physician is obliged to follow the Health Unit's antibiotics policies.

Indication   Culture
[Select an option... ▾]   [Select an option... ▾]

Infection Type
[Select at least an option... ▾]

Remarks

[   ]

remaining 255 of 255 characters

☐ Comments   ☐ Not follow center schedules   ☐ PRN Medication

TIBIOTIC FORM [PROTOTYPE]

ramme
Bahrain

dra   I-SEHA

وَزَارَةُ الصِّحَّة
Ministry of Health

قرار رقم 45 – 48 /2016

المبادرة 3. تعميم مشروع ترشيد استخدام المضادات الحيوية على 57 جناح في مجمع السلمانية الطبي

وصف المبادرة
1. زيادة عدد الاجنحه في مشروع الاستخدام الامثل للمضادات الحيوية
2. زيادة الطاقم الطبي العامل عليه
3. اعداد النتائج و تحليلها و مقارنتها بدول العالم

المتطلبات التشريعية وتعديل أنظمة الدليل المالي الموحد (أن وجد)	الاثر المالي السنوي	تكلفة تنفيذ المبادرة(أن وجد)	الجهات المسئولة عن التنفيذ	الاطار الزمني	آخر مستجدات المبادرة	خطوات التنفيذ
لا يوجد		لا يوجد	وزارة الصحة	يناير الى ديسمبر 2016	قيد التنفيد (تم)	**1.المرحله الاولى**
لا يوجد	سيتم حساب الاثر المالي بعد التطبيق على كافه الاجنحه النتائج الاوليه توضح امكانيه توفير 500.000 دينار سنويا	لا يوجد	وزارة الصحة	يناير الى ديسمبر 2016 (تم)	تم البدء باول عشرة اجنحه منذ ديسمبر 2015 لقد تم اضافة عشرة اجنحة منذ فبراير 2016 1 مايو سيضاف عشره اجنحه اخرى	1.1 تغطية 40 جناح بمعدل 10 اجنحة كل 3 اشهر (من العدد الاجمالي 56 جناح) 1.2
لا يوجد		سيتم تنفيذ ورش عمل بالتعاون مع شركات الادوية: - تم تنفيذ ورشتين عمل	وزارة الصحة	يناير الى ديسمبر 2016 (تم)	لقد تم تدريب 10 اطباء و سيتم اضافه 10 اخرين في ابريل 2016 تم تخصيص طبيبين للعامل بشكل متفرغ في البرنامج	1.2 تدريب عدد اكبر من الاطباء و الممرضات ليتسنى تغطية جميع الاجنحة
				(تم)		**2. المرحله الثانيه**
لا يوجد	- تم الاتفاق علي ايقاف 3	لا يوجد	وزارة الصحة	مايو 2016 – يونيو (2017)	تم الاجتماع مع الرعايه الصحيه الاوليه - وضعت خطط العمل	2.1 البدء ببرنامج الاستخدام الامثل للمضادات الحيويه في الرعاية

9. National antibiotic campaign
one year plan to extend
survey pre and post campaign

The impact

DDD Per 1000 Patient Days

Group ● Antiprotozoal ● Carbapenemes ● Cephalosporin (3rd) ● Cephalosporin (4th) ● Glycopeptides ● Glycylcycline ● Macrolides ● Oxazolidinones ● Penicillins ● Polypeptides ● Quinolones
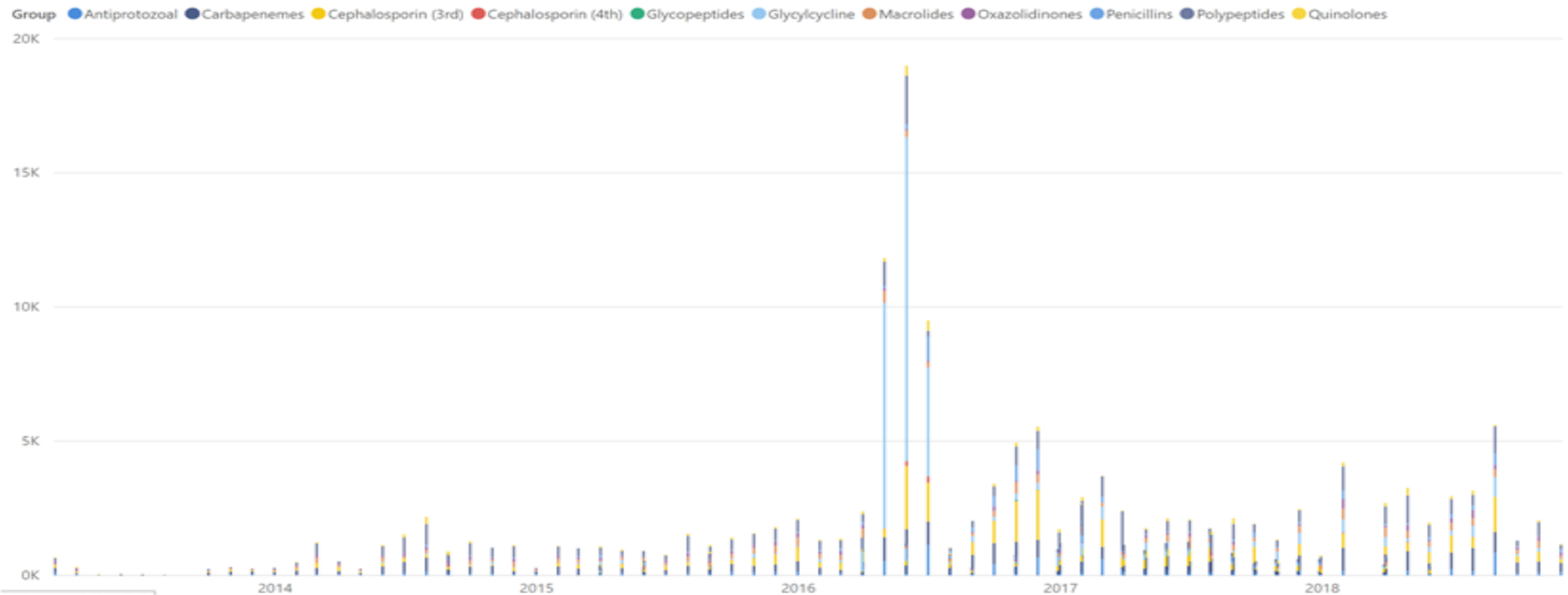
ALL OF HOSPITAL
916 DDD/1000
BED DAYS

ICU
1479 DDD/1000
BED DAYS

SOURCE
Antimicrobial use in Australian Hospitals. 2015 Report. https://www.
safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/

NB These figures are for adult patients

Total COST (Bahraini Dinars)

Group ●Antiprotozoal ●Carbapenemes ●Cephalosporin (3rd) ●Cephalosporin (4th) ●Glycopeptides ●Glycylcycline ●Macrolides ●Oxazolidinones ●Penicillins ●Polypeptides ●Quinolones

Primary care

Statistics for Prescribed Antibiotics in Primary Care for OCTOBER-2018

Physician			Medication	Centre	Antibiotics Prescribed
AALA ALQARI			(ACYCLOVIR 200 mg/ 5 ml) Suspension	MUHARRAQ HEALTH CENTER	1
AALA ALQARI			(AMOXICILLIN + CLAVULANIC ACID) 457	A' ALI HEALTH CENTER	119
AALAA ABUSHAQRA			(AMOXICILLIN + CLAVULANIC ACID) 457	AHMED ALI KANOO HEALTH CENTER	173
AALAA ABUSHAQRA			(AMOXICILLIN + CLAVULANIC ACID) 457	AIRPORT CLINIC	2
AALAA NAEEM MOHAMED ABUSHAQRA			(AMOXICILLIN + CLAVULANIC ACID) 457	AL BUDAIYA HEALTH CENTER	1
AALAA NAEEM MOHAMED ABUSHAQRA			(AMOXICILLIN + CLAVULANIC ACID) 457	AL HOORA HEALTH CENTER	21
AAMAL MOHAMED JASIM HUSAIN			(AMOXICILLIN + CLAVULANIC ACID) 457	AL KUWAIT HEALTH CENTER	127
AAYAT SALAH ALI JADALLA			(AMOXICILLIN + CLAVULANIC ACID) 457	AL ZALLAQ HEALTH CENTER	2
ABBAS ABDULMOHSEN MERZA ALDALLAL			(AMOXICILLIN + CLAVULANIC ACID) 457	BBK HEALTH CENTRE - HIDD	53
ABBAS ABDULMOHS			(AMOXICILLIN + CLAVULANIC ACID) 457	BILAD AL QADEEM HEALTH CENTER	56
ABDULHALIM HASAN			(AMOXICILLIN + CLAVULANIC ACID) 457	BUDAIYA COASTAL HEALTH CLINIC	49

Result for infuction drug for health center

| Uom | 2016 | | 2017 | |
	1-1-2016 to 30-4-2016		1-1-2017 to 30-4-2017	
	Net Qty	Net Value	Net Qty	Net Value
Vial	1770	506	374	93
Bottle	172044	50191	41932	12778
Tablet	5483119	295278	1315755	67390
total	5656933	345975	1358061	80261

11. Decrease antibiotic consumption and costs

- There was a major saving in the costs of the antibiotics reaching couple of millions dinnars per year

- Re alignment of the exiting budget: saving budget from unneeded prolonged/inappropriate use of antibiotics, in which saved money is being used for development of other projects and renovation of existing facilities

12. Rate of MDROs
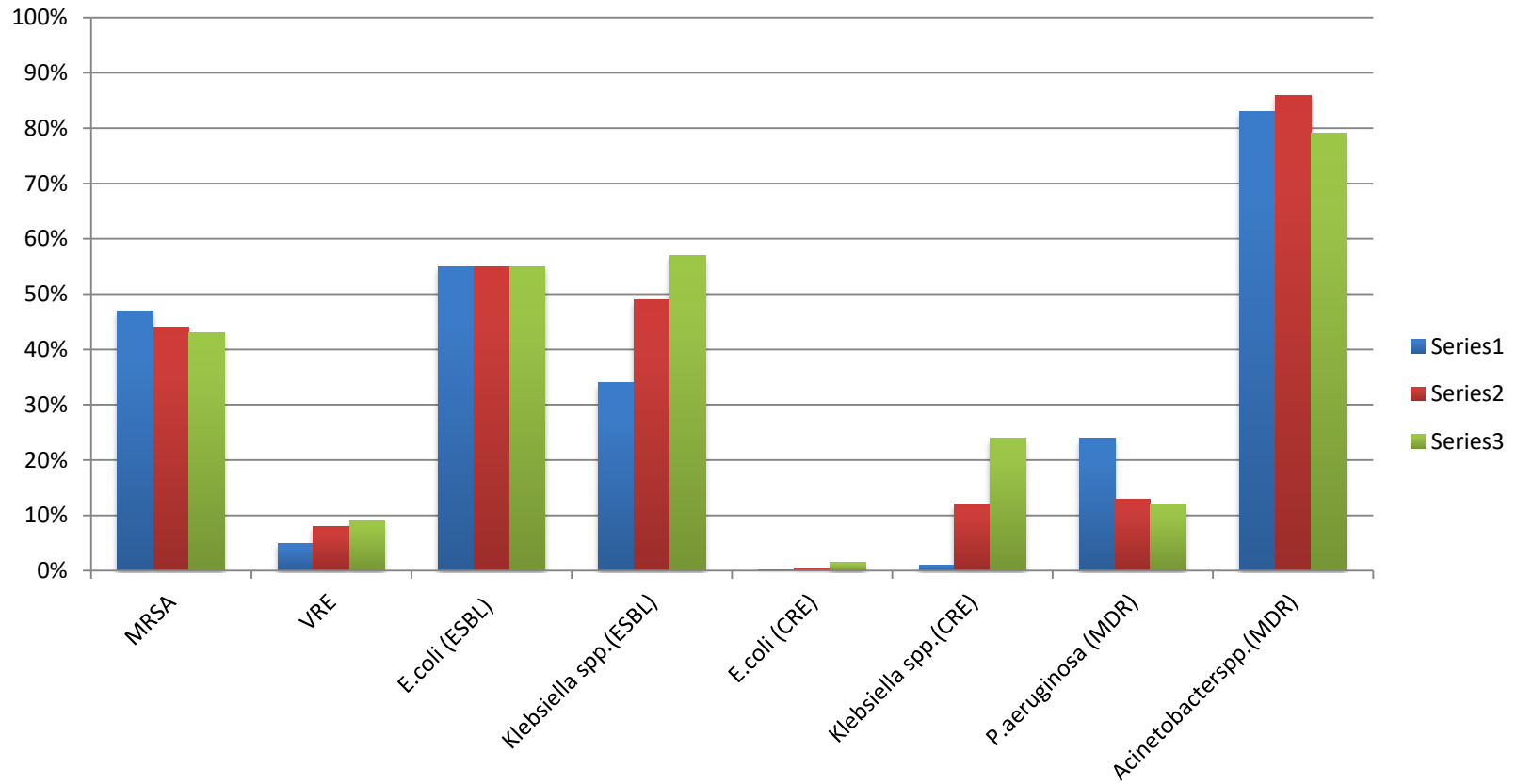
13. Rate of hospital acquired infection !!

- WE do have CLABSI :

  – 2013: 7.7 /1000 line days

  – 2014: 7.4 /1000 line days

  – 2015 : 2.8/1000 line days

  – 2016(till now) : 5.4 /1000 line days

- Catheter related UTIs
  – 2013: 6.5 /1000 line days
  – 2014: 5.4 /1000 line days
  – 2015 : 4.3/1000 line days
  – 2016(till now) : 4 /1000 line days

14. Pharma-economics

Total saving for all monitored ward (2013-2014)

Antibiotic	min	max	75%	Estimated total cost per month (without intervention)	Estimated Saving per month	Estimated Saving in 2 years for monitored wards (Per ward)	Predicted saving per year in all hospital wards
Ceftriaxone	7.56	94.5	70.875	165.375	158	3,788	94,689
ciprofloxacin	8.86	318	238.5	556.5	548	13,143	328,584
clarithromycin	43.01	379.88	284.91	664.79	622	14,923	373,068
colistin	46.71	739.59	554.6925	1294.2825	1,248	29,942	748,544
imipenem	65.17	782.07	586.5525	1368.6225	1,303	31,283	782,072
linezolid	264.9	2860.92	2145.69	5006.61	4,742	113,801	2,845,026
meropenem	227	2869.79	2152.3425	5022.1325	4,795	115,083	2,877,080
metronidazole	1.87	20.52	15.39	35.91	34	817	20,424
pipercillin	82.69	1984.5	1488.375	3472.875	3,390	81,364	2,034,111
tigecycline	189	1549.8	1162.35	2712.15	2,523	60,556	1,513,890
vancomycin	1.27	72.39	54.2925	126.6825	125	3,010	75,248
amoxicillin	1.26	15.06	11.295	26.355	25	602	15,057
ampicillin	1.56	9.72	7.29	17.01	15	371	9,270

Antibiotic	min	max	Estimated Saving per mo	estimated saving per year (one ward)	estimated saving in 2 years (one ward)	Estimated saving per year in monitored wards (ICU,51,53,56,204)	Predicted saving per year in all hospital wards
Ceftriaxone	7.56	94.5	86.94	1,043	2,087	5,216	52,164
ciprofloxacin	8.86	318	309.14	3,710	7,419	18,548	185,484
clarithromycin	43.01	379.88	336.87	4,042	8,085	20,212	202,122
colistin	46.71	739.59	692.88	8,315	16,629	41,573	415,728
imipenem	65.17	782.07	716.9	8,603	17,206	43,014	430,140
linezolid	264.9	2860.92	2596.02	31,152	62,304	155,761	1,557,612
meropenem	227	2869.79	2642.79	31,713	63,427	158,567	1,585,674
metronidazole	1.87	20.52	18.65	224	448	1,119	11,190
pipercillin	82.69	1984.5	1901.81	22,822	45,643	114,109	1,141,086
tigecycline	189	1549.8	1360.8	16,330	32,659	81,648	816,480
vancomycin	1.27	72.39	71.12	853	1,707	4,267	42,672
amoxicillin	1.26	15.06	13.8	166	331	828	8,280
ampicillin	1.56	9.72	8.16	98	196	490	4896
			10,756	129,071	258,141	645,353	6,453,528

15. The other results
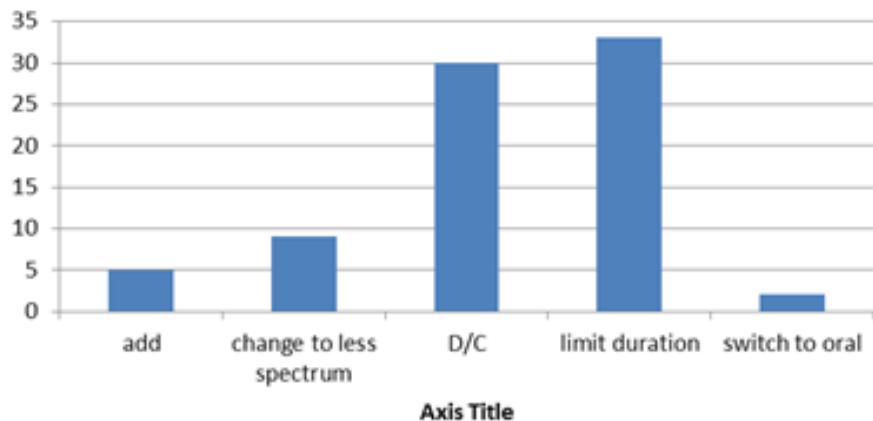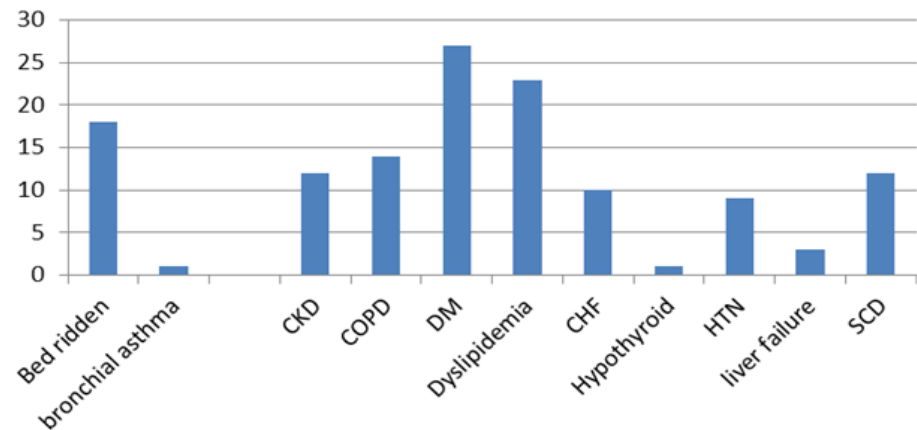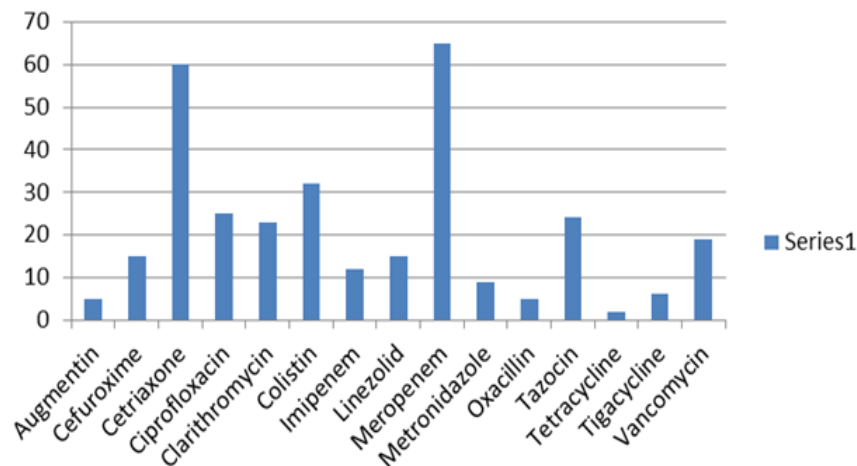
16. Collaborative work

- 1. all health care workers in the ministry

- 2. in the kingdom of Bahrain (private and other governmental sectors)

- 3. in the region (Ministers of health meeting in Cairo 2017 march), shared in Oman in ECCMID symposium and Dubai as on of the top 5 excellence governmental projects in Bahrain)

- 4. The national antibiotic committee

- 5. regional conference and meeting

- 6. Bahrain infectious disease annual conference

Challenges

- Literature often not clear in Infectious Diseases
- Everyone thinks they know how to use antibiotics
- Providers perceive autonomy is lost
- Medicolegal implications of responsibility for patients
- Difficulty proving impact of program(∅ national measures)
- Financial pressures dictating decisions
  - Pharmaceutical manufacturers
  - Hospitals
  - Patients

The Approach to the Problem Prescriber

- ## Carefully plan your approach:
  - Pick your battles
  - Timing is important
  - Avoid heat of the moment confrontations (generate light not heat)

- ## Do your homework
  - Gather as much data as possible
    - DUE: Service and physician specific for several drugs
    - Discuss with Clinical PharmDs and discretely other MDs
    - Discuss with CMO/Chief of staff
  - Understand the MD's Practice and Patient Population

Critical Success Factors Identified

- Collegial and educational relationship
- Daily review of antimicrobial orders by a consistent accountable team
- Support of hospital/medical leadership
- Development of criteria and guidelines for anti-infective use
- Formulary restriction
- Education of prescribers to insure compliance
  - **But the most important one is investing in the human factor**

The recognition of the project:

INTERNATIONAL BEST PRACTICE COMPETITION

INTERNATIONAL BEST PRACTICE CO

Al Jazeera International Cateri
Joint Winners of the 4th

To be held 25/26th April, 2017
Mumbai - India

FASTEST · FIRST

INTERNATIONAL

INNOVATIVE

BEST

INNOAONNI

LEADING-EDGE · QUALITY · LEANEST ·

PRACTICE

EXCELLENCE · LEADING

EXCELLENCE

COMPETITION

INTRODUCTION	FORMAT/TIMELINE	ENTRY FORM	PRESENTATION GUIDELINES	CONTACT US

HOME

Organisers of the Best Practice Competition:

5th International Best Practice Competition &
1st Organisation-Wide Innovation Award in
2017

Dubai Government Excellence Program
The Executive Council
Government of Dubai

برنامج دبي للأداء الحكومي المتميز
المجلس التنفيذي
حكومة دبي

g Training
ril 2017

Under the Patronage of
His Highness Sheikh Mohammed Bin Rashid Al Maktoum
UAE Vice President, Prime Minister and Ruler of Dubai

Dubai International Government Achievements Exhibition
"National Governments ... Global Achievements"

2 - 4 April 2017
Dubai World Trade Centre
Dubai, United Arab Emirates

تعقد اللجنة اجتماعاتها بناءً على دعوة من رئيسها أو نائبيه بصورة دورية مرة كل شهر على الأقل أو كلما دعت الحاجة إلى ذلك. ولا يكون اجتماع اللجنة صحيحاً إلا بحضور أغلبية أعضائها على أن يكون من بينهم الرئيس أو نائبه.

وتصدر اللجنة قراراتها بأغلبية أصوات الأعضاء الحاضرين. وعند تساوي الأصوات يُرجح الجانب الذي منه الرئيس.

ويجوز للجنة أن تستعين بمن تراه مناسباً من الخبراء المؤهلين، ومن ذوي الخبرة والاختصاص لحضور اجتماعاتها أو لتزويدها بالمعلومات التي تراها ضرورية لمباشرة اختصاصاتها، ولا يكون لمن يُستعان بهم في أعمال اللجنة حق التصويت.

وترفع اللجنة تقريراً دورياً يتضمن نتائج أعمالها وتوصياتها إلى المجلس الأعلى للصحة لاتخاذ اللازم بشأنه.

<u>المادة الخامسة</u>

على الجهات المعنية تنفيذ هذا القرار- كل فيما يخصه - ويُعمل به إعتباراً من تاريخ صدوره.

الفريق طبيب

محمـــــد بـــن عبـــد الله آل خليفـــة

رئيـــس المجلــــس الاعلـــى للصحـــة

قرار رقم (٢٢) لسنة ٢٠١٧

بشأن إنشاء وتشكيل لجنة "الاستخدام الأمثل لل

<u>رئيس المجلس الأعلى للصحة :</u>

بعد الاطلاع على المرسوم بقانون رقم (٣) لسنة ١٩٧٥ بشأن الصحا وعلى القانون رقم (٣٨) لسنة ٢٠٠٩ بإنشاء الهيئة الوطنية لتنظيم بالمرسوم بقانون رقم (٣٢) لسنة ٢٠١٥.

وعلى المرسوم بقانون رقم (٢١) لسنة ٢٠١٥ بشأن المؤسسات الص وعلى المرسوم رقم (٥) لسنة ١٩٩٧ بإعادة تنظيم وزارة الصحة. وت وعلى المرسوم رقم (٥) لسنة ٢٠١٣ بإنشاء المجلس الأعلى للصحة. الم وبناءً على عرض وزيرة الصحة.

وبعد موافقة المجلس الأعلى للصحة في جلسته رقم (٣) المنعقدة بت

<u>قرر الآتي:</u>

<u>المادة الأولى</u>

تنشأ بالمجلس الأعلى للصحة لجنة تسمى "لجنة الاستخدام الأمثل في هذا القرار بكلمة "اللجنة". وتشكل برئاسة الدكتورة جميلة السا

| رئيـــس الصـــيادلة بمجمـــع الســلمانية الطبـي - |
| استشــاري الاحيــاء الدقيقــة بمجمـع الســلمانية الطبي |
| استشاري امراض معدية او احياء دقيقة من مستشفى الملا |
| رئيـس الصــيادلة مــن مستشــفى الملــك حمـ |
| استشاري امراض معدية او احياء دقيقة من مستشفى ا |

صدر في : ٥ شـــوال ١٤٣٨هـ

الموافق:٢٩ يونيـــو ٢٠١٧م

Establish a governance body	August /2017	Multidisciplinary team	
Planning	September 2017-march 2018	Strategic plan : 5 main objectives	1. The vision and mission 2.The strategic plan 3. The operational plan 3.Maintaince , monitoring and evaluation phase
Situation analysis	Jan 2018-april 2018	Preparing the forms and disseminate	
Initiate implementation	April 2018-october 2018	1. The complete package 2. The training tools 3. The training program	
Periodic review and reports	April 2018 – on going		

Around 50 pages

Global action plan strategic objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Awareness-raising and risk communication

Objective 1	Increase national awareness of AMR	
	Strategic interventions	**Activities**
	1.1. Establish an evidence-based public communications programme targeting audiences in human health practice. *Milestone:* April 2018	1.1.1. Estimate awareness and knowledge through behavioural studies in different social and professional groups. To conduct researches in this field to study the awareness among public 1.1.2. Conduct antibiotic campaign in the week of November 2018 1.1.3. Prepare materials for the media 1.1.4. Prepare educational materials for the public 1.1.5. Prepare program for the universities and schools 1.1.6. Establish awards for the best media and public education materials 1.1.7. To establish a website 1.1.8 to establish a newsletter
	1.2. develop well-structured workshops for the health care workers 1.3 develop educational session for the public 1.4 develop educational materials	1.2.1. To set a whole educational program or a full year program for education for all health care workers 1.2.2. The program has to be tailored to all the subgroups 1.3.1. To prepare the materials for the public the suits, written, newspapers, TV, social media 1.4.1. Develop all educational materials for all sub categories

Education

Objective 2	Improve knowledge of AMR and related topics	
	Strategic interventions	**Activities**

The current situation analysis
2 parts

- 1. the existing data (MDRO and antibiotic consumption)
- 2. the infrastructures and basic knowledge fro all involved hospitals

Staphylococcus aureus Antibiotic Susceptibility All Specimen

(2014-2015)
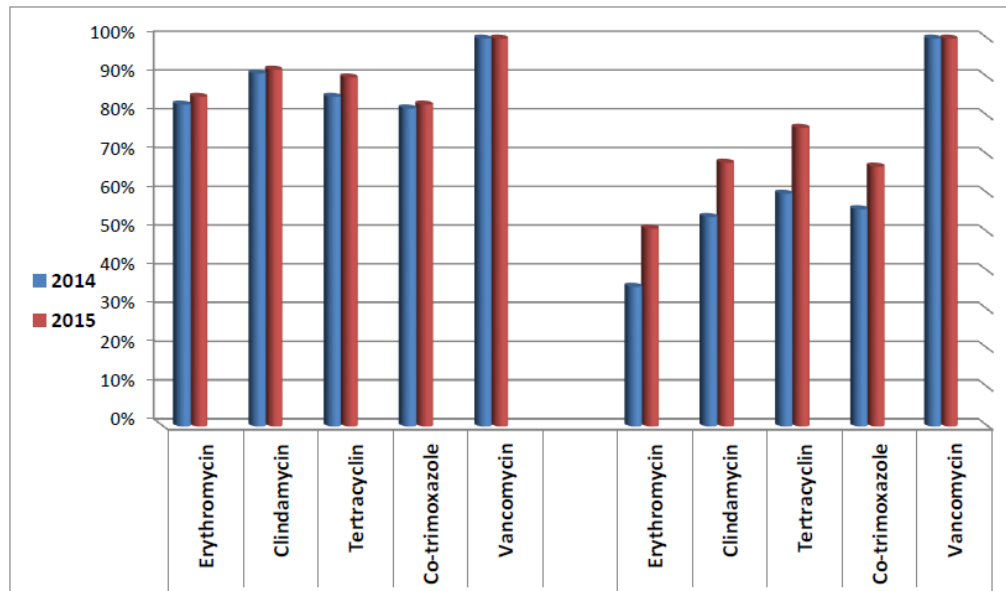
The Guidelines

To be Finalized (it toke 18 months)

- The most common syndromes:
- 1. sepsis
- 2. UTI
- 3. Pneumonia (CAP / HAP)
- 4. soft tissue infection
- 5.diabetic foot
- 6. URTI
- 7. Antibiotic surgical prophylaxis
- 8. Endocarditis

The education

- **First part** : Basic concepts in AMR antimicrobial resistance and general guidelines :
  - Part a for physicians : please see attached
  - Part b for nurses please see attached
- **The second** training type will be hands on the program Tools ; will be provided later
- Second part (hand on training)
- 1. MDRO (WHOnet/ GLASS)
- 2. Antibiotic consumption
- 3. HAI surveillance
- **The third part**:
  - Method of implementation and reporting
  - Competencies needed
  - Policies
  - Accreditations

Animal sector

- A. Actions taken by Control & Animal Health Directorate to combat AMR, detailed in the followings:
- 1.   Banning of Importation of Enrofloaxcin solution to be used in poultry industry.
- 2.   Banning of Importation of Colistin antibiotic to be used in poultry industry.
- 3.   Banning of using of Tilcomycin egg producing farms.
- 4.   Antibiotics will be listed as POM-V.
- 5.   Prohibition of using antibiotics as growth promoter in the feed of animals.
-
- B. Amount of Antibiotics utilized in veterinary field was reduced after implementation of the above restrictions. 5316 kg of antibiotics was utilized in 2016 and until September 2017, only 710 kg of antibiotics was reported to be utilized in the veterinary field.

Upload history

Filter

| Country | [ ] | Year | [ ] |

🔄 Reset   🔍 Search

To delete your AMR data base, please :
- Delete Sample upload to delete all Sample data and corresponding RIS data.
- Delete RIS upload to delete all RIS lines with no corresponding Sample data.

	File type ⌃⌄	Country ⌃⌄	Batch Id ⌃⌄	Year ⌃⌄	Start ⌃⌄	End ⌃⌄	Specimens	Status ⌃⌄	Date ⌃⌄	Filename ⌃⌄	Input Line Nb ⌃⌄	Output Line Nb ⌃⌄
☰	RIS	BHR	Data Set 1	2018	January	December	Blood, Genital, Stool, Urine	Done	2019-08-07 17:53:38	GLASS-BHR-2018-DS1-RIS.txt	2536	2536
☰	RIS	BHR	Data Set 1	2017	January	December	Urine	Done	2018-10-26 12:31:29	BHR_GLASS_URINE_RIS.txt	198	198
☰	RIS	BHR	Data Set 1	2017	January	December	Urine	Done	2018-10-25 18:20:44	GLASS_URINE_RIS.txt	198	198
☰	RIS	BHR	Data Set 1	2017	January	December	Blood	Done	2018-10-04 16:58:21	GLASS_BLOOD (KLEP)_2017.txt	180	180
☰	RIS	BHR	Data	2017	January	December	Blood	Done	2018-10-	GLASS_BLOOD_(ESCOL)_2017.txt	210	210

Antibiotic Stewardship Program

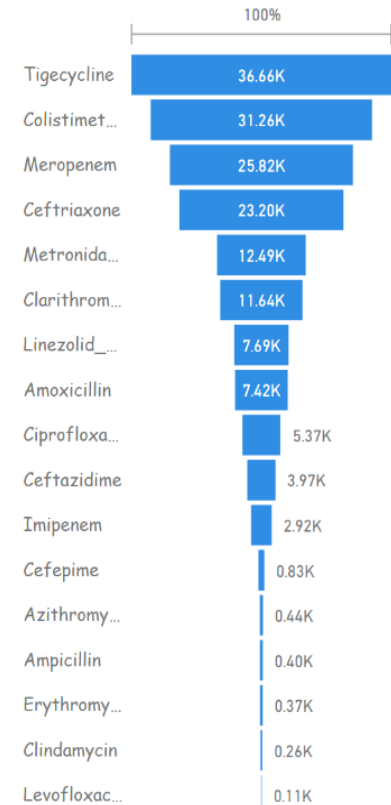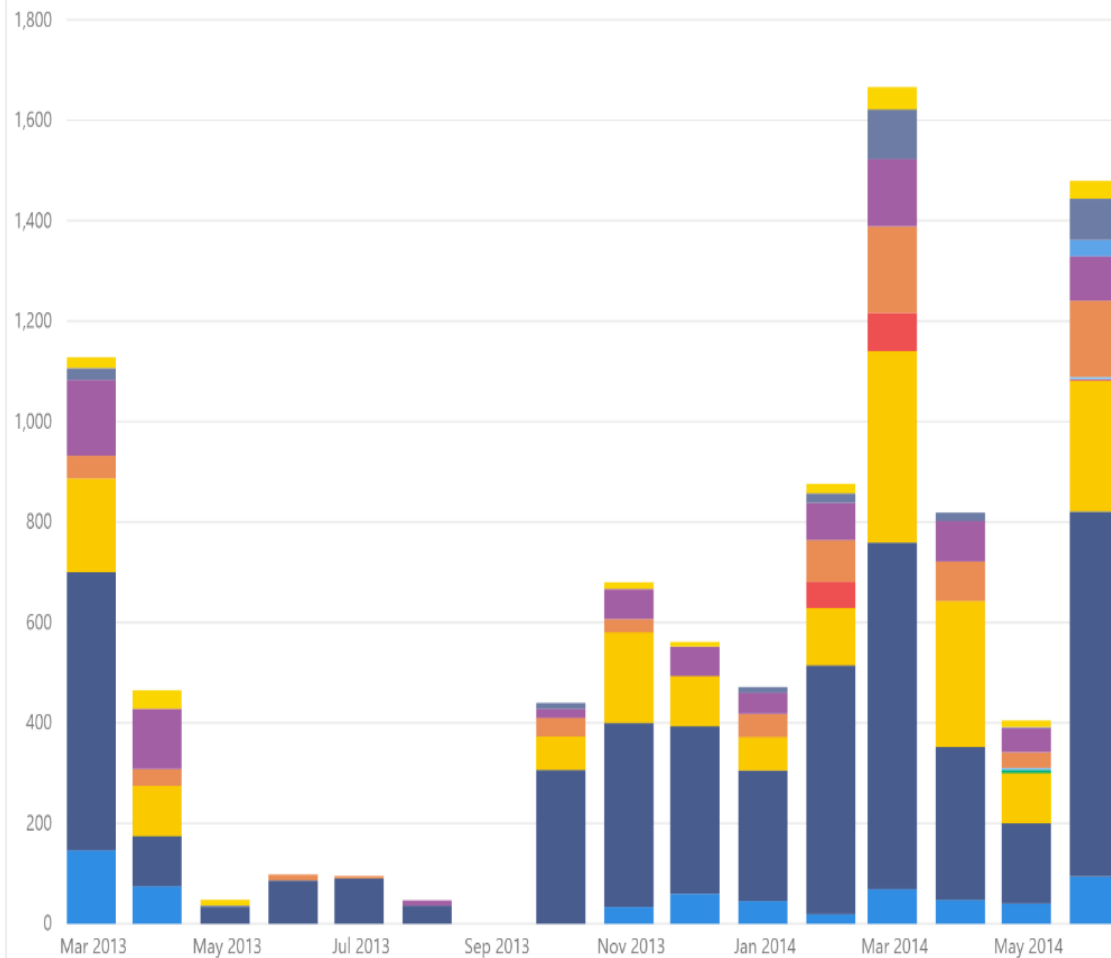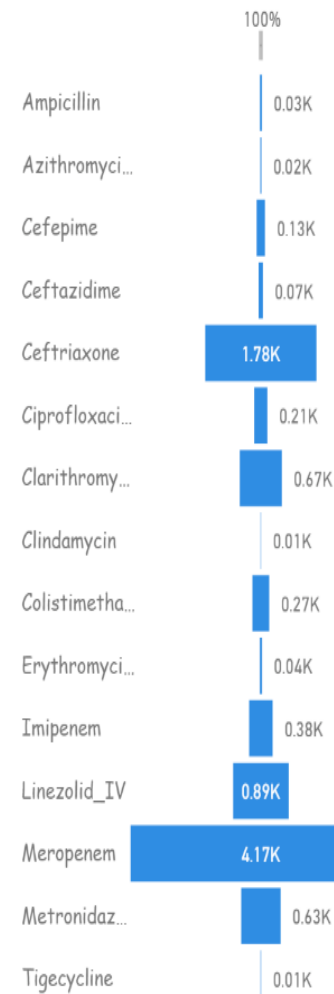Bahrain antibiotics stewardship

550.00

Grams Per 1000 Patients Days

Group ● Antiprotozoal ● Carbapene... ● Cephalospori... ● Cephalospori... ● Glycopepti... ● Glycylcycline ● Macrolides ● Oxazolidin... ● Penicillins ▶

Grams by Antibiotic

	100%
Ampicillin	0.03K
Azithromyci...	0.02K
Cefepime	0.13K
Ceftazidime	0.07K
Ceftriaxone	1.78K
Ciprofloxaci...	0.21K
Clarithromy...	0.67K
Clindamycin	0.01K
Colistimetha...	0.27K
Erythromyci...	0.04K
Imipenem	0.38K
Linezolid_IV	0.89K
Meropenem	4.17K
Metronidaz...	0.63K
Tigecycline	0.01K

25.7%
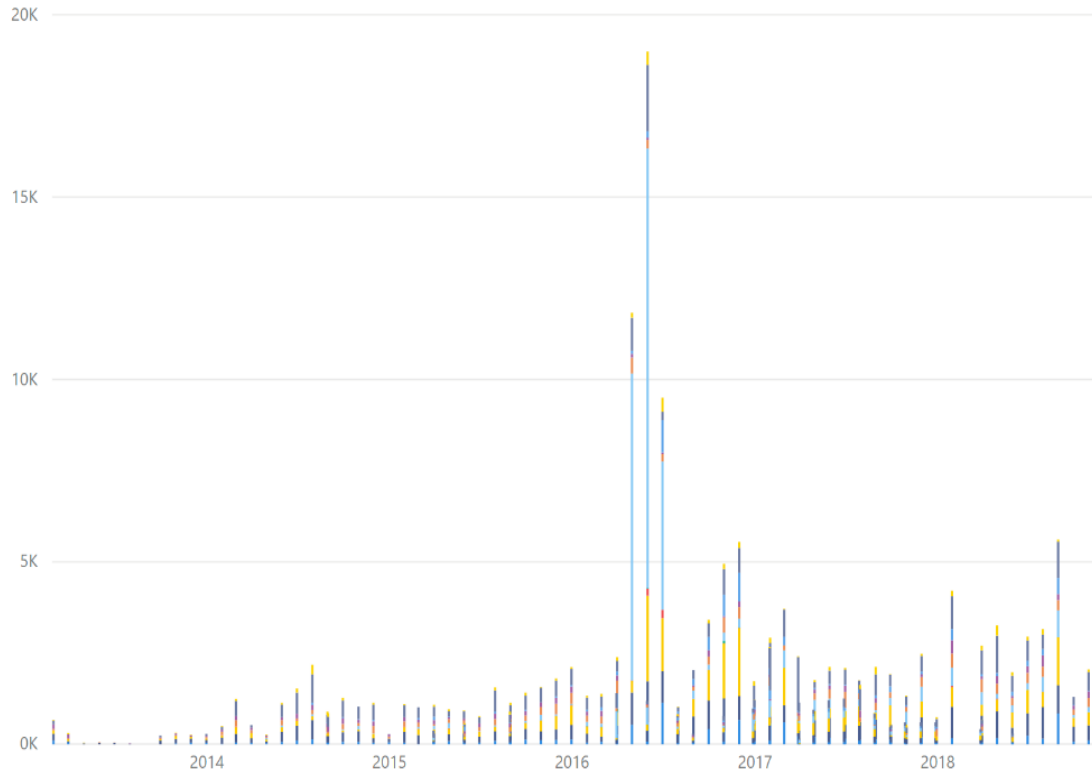
Group

All

Ward ID

All

Date (MM/YYYY)

2/28/2013

5/31/2014

DDD	Grams
DOT	Cost

Trend

Activate W

# Quality indicators for the strategic plan (for 5 years)

- **Outcome measures**
  - Rate of c diff
  - mortality rate due to infections
  - Length of stay in all hospitals
  - The rate and types of antibiotic use per the suggested syndromes
  - Compliance with surgical antibiotic prophylaxis
  - Number of trained staff /sessions./ workshops
  - Number of isolate suggested and their trend and patterns of resistance
  - Calculating ddd or dot
  - Cost in animals for antibiotic
  - Cost in humans
  - Rate for compliance with guidelines

- **Process measures**
  - Duration of treatment
  - Iv to po

Figure 7: With links to many different national plans and strategies, NAPs are often a 'plan of plans'
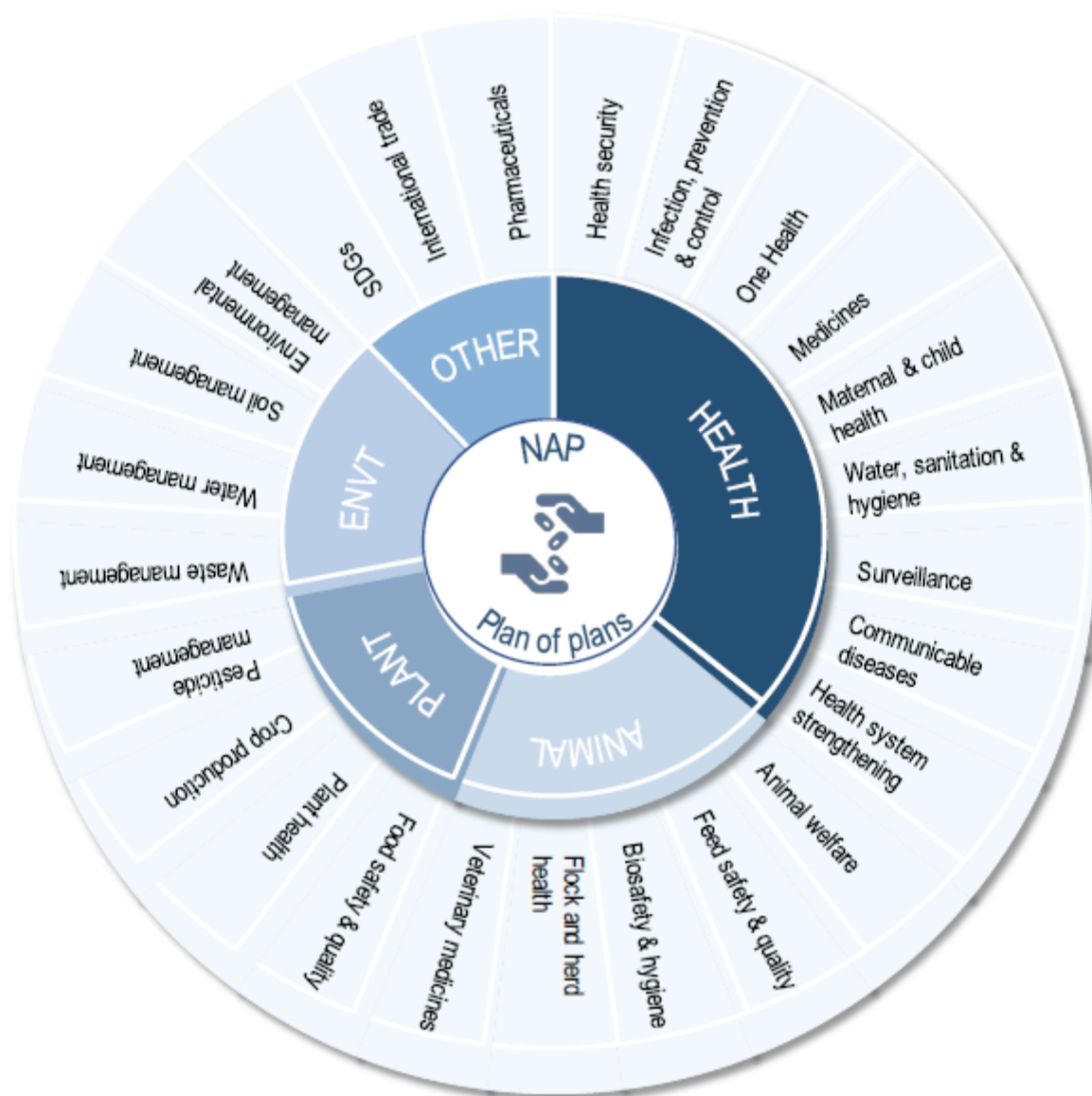
Lessons I've Learned…

- Take your time and do your homework

- Culture matters and dictates everything else

- Obtain dedicated FTE from Hospital Administration (Consider home in Quality)

- Reporting structure matters …
  - Pharmacists and MDs can be pulled away if managers don't buy-in to stewardship

- Obtain leadership skills (local and national workshops)

- Stewardship burnout is real…Pursue scholarly work and outside networking

The secret of change is to focus all of your energy, not on fighting the old, but on building the new.

–Dan Millman

Put your leadership and communication skills together to sell your results to the people in suits

What I've learned through the years

"Can you afford to do it? No!"
"Can you afford *not* to do it? No!"

"*Price* is what you pay; *value* is what you get."

Warren Buffet