Hospital Infection Control from a Developing Country's Perspective

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BSP (UK), IFBA CP, CertEID (US), RBP (US)

Hosted by Martin Kiernan
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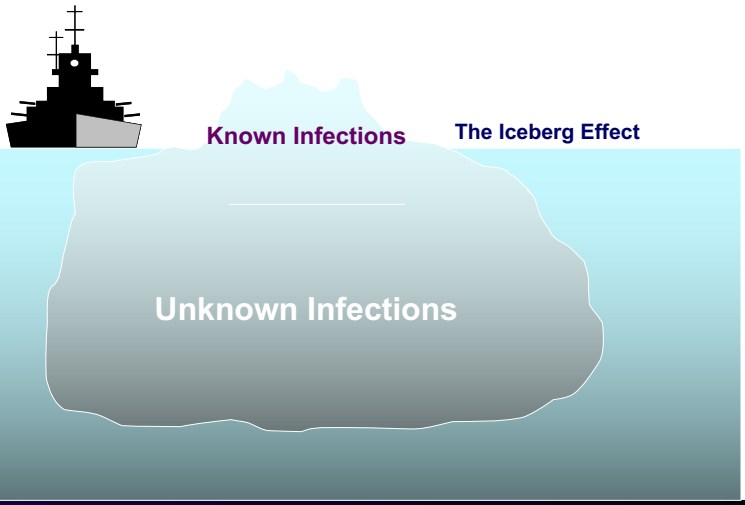
www.webbertraining.com July 17, 2018

Background



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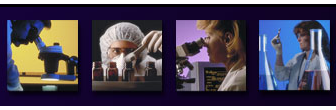
Microbes & Humans

- **Microbes:** 5×10^{31}
  (50,000,0000,000,000,0000,000,0000,000,000)
- **Humans:** 6×10^{9}
  (6,000,000,000)

Microbiology in the 21st century, ASM, 2004 3

Super Bugs



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Scand J Infect Dis 36: 790–794, 2004

Outbreak of Vancomycin Resistant Enterococcus in a Hematology/Oncology Unit in a Korean University Hospital, and Risk Factors Related to Patients, Staff, Hospital Care and Facilities

HYANG SOON OH[1], EUI CHONG KIM[2], MYOUNG DON OH[3] and KANG WON CHOE[3]

INFECTIOUS DISEASES

Resistant Staph Finds New Niches

Huge, painful boils and abscesses that must be cut open and drained before they can heal: Those are the scary symptoms of a ma-

people never notice it. But sometimes MRSAs can cause severe skin and soft tissue infections and, when they reach the lungs,

Birth of a supergerm

Monday, December 01, 2003

Scientists say they've determined the genetic trick by which a dangerous germ acquired resistance to a highly potent antibiotic, earning itself supergerm status in the process.

The bug is *Staphylococcus aureus*, a leading cause of skin and bloodstream infections; the drug is vancomycin. Until recently, vancomycin was the staph-fighting equivalent of the Powell Doctrine - overwhelming force against a vulnerable enemy.

Study Finds Spread of Resistant Staph

By THE ASSOCIATED PRESS

Published: April 7, 2005

By The Associated Press

Dangerous drug-resistant staphylococcus infections are s

outside hosp

Until recent

settings, wh

complicatio

athletes.

RESEARCH

Multidrug-resistant *Acinetobacter baumannii*

Aharon Abbo,* Shiri Navon-Venezia,* Orly Hammer-Muntz,* Tami Krichali,* Yardena Siegman-Igra,* and Yehuda Carmeli*

Antimicrobial resistance of *Neisseria gonorrhoeae* in Japan, 1993–2002: continuous increasing of ciprofloxacin-resistant isolates

shi Tanaka[a,*], Hiroshi Nakayama[b], Takashi Notomi[a], Shin-ichiro Irie[a], chi Tsunoda[a], Aya Okadome[a], Takeshi Saika[c], Intetsu Kobayashi[c]

4

Economy

Financial Burden

5

Financial Effects

- USA $ 6.65 B
- Europe € 7 B
- UK £ 1 B
- Turkey $ 1 B

6

Cost Effectiveness

Infection	Cost Savings
VAP	$25,072
Bacteremia	$23,242
Surgical Site infection	$10,443
UTI	$ 758

Anderson, et al. Infect Control Hosp Epidem 2007;28:767-73

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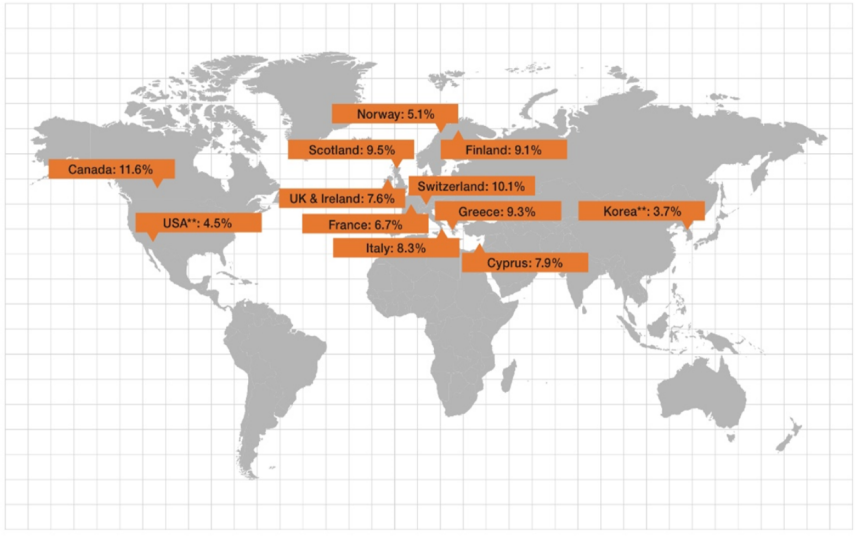
Prevalence
Developed countries



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Prevalence
Developing countries

* Systematic review conducted by WHO, 1995-2008

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Device-associated infection rates in critical care in developing countries

Table 1. Device-associated infection rates in critical care in developing countries compared with the United States National Healthcare Safety Network rates

Surveillance network, study period, country	Setting	No. of patients	CLA-BSI*	VAP*	CR-UTI*
INICC, 2002–2007, 18 developing countries†	PICU	1808	6.9	7.8	4.0
NHSN, 2006–2007, USA	PICU	/	2.9	2.1	5.0
INICC, 2002–2007, 18 developing countries†	Adult ICU#	26155	8.9	20.0	6.6
NHSN, 2006–2007, USA	Adult ICU#	/	1.5	2.3	3.1

* Overall (pooled mean) infection rates/1 000 device-days
INICC = International Nosocomial Infection Control Consortium; NHSN = National Healthcare Safety Network; PICU = paediatric intensive care unit; CLA-BSI = central line-associated bloodstream infection; VAP = ventilator-associated pneumonia; CR-UTI = catheter-related urinary tract infection.
† Argentina, Brazil, Colombia, Costa Rica, Cuba, El Salvador, India, Kosovo, Lebanon, Macedonia, Mexico, Morocco, Nigeria, Peru, Philippines, Turkey, Uruguay
# Medical/surgical ICUs

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Reported incidence rates

Catheter-associated bloodstream infections in surveillance networks in ICUs

- **NHSN:** **2.7 per 1000 catheter-days (1.5/1'000 – 6.8/1'000)**
- **Michigan:** **2.7 per 1000 catheter-days (median before intervention)**
- **Germany:** **2.1 per 1000 catheter-days**
- **18 developing countries:** **8.9 per 1000 catheter-days**

Edwards RJ. Am J Infect Control 2007; 35:290 – Gastmeier P. J Hosp Infect 2006; 64: 16
Pronovost P. N Engl J Med 2006; 355:26 – Rosenthal V. Am J Inf Control, 2008:36:627-637

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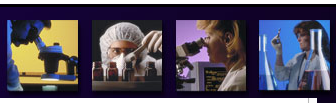


Status of Hospital Infection Control Measures at Seven Major Tertiary Care Hospitals of Northern Punjab

April 2010 · Journal of the College of Physicians and Surgeons--Pakistan: JCPSP 20(4):266-70
Source · PubMed

Aamer Ikram · Sayed Ibrar Hussain Shah · Sajida Naseem · Show all 8 authors · Saifullah Khan Niazi

Bacterial biofilm-based catheter-associated urinary tract infections: Causative pathogens and antibiotic resistance

AJIC 2017

Nargis Sabir, MBBS *, Aamer Ikram, MBBS, MCPS, FCPS, PhD, FRSTMH, FRCP, FRCPath, Gohar Zaman, MBBS, FCPS, Luqman Satti, MBBS, FCPS, Adeel Gardezi, MBBS, FCPS, Abeera Ahmed, MBBS, Parvez Ahmed, MBBS,MCPS,FCPS, FRCP

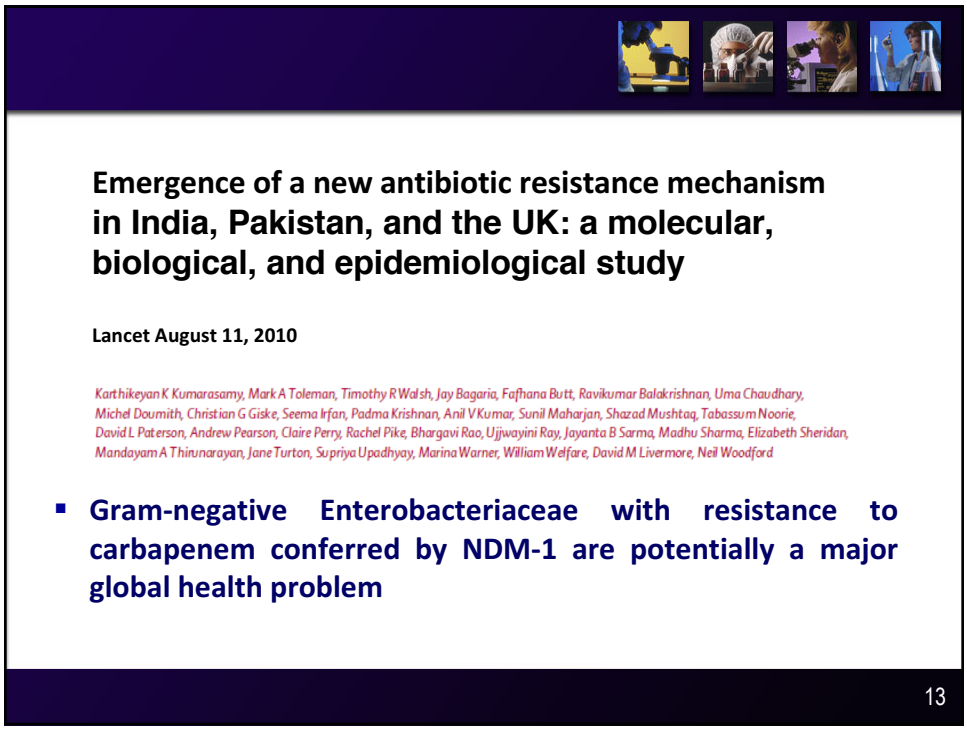
AJIC 2016

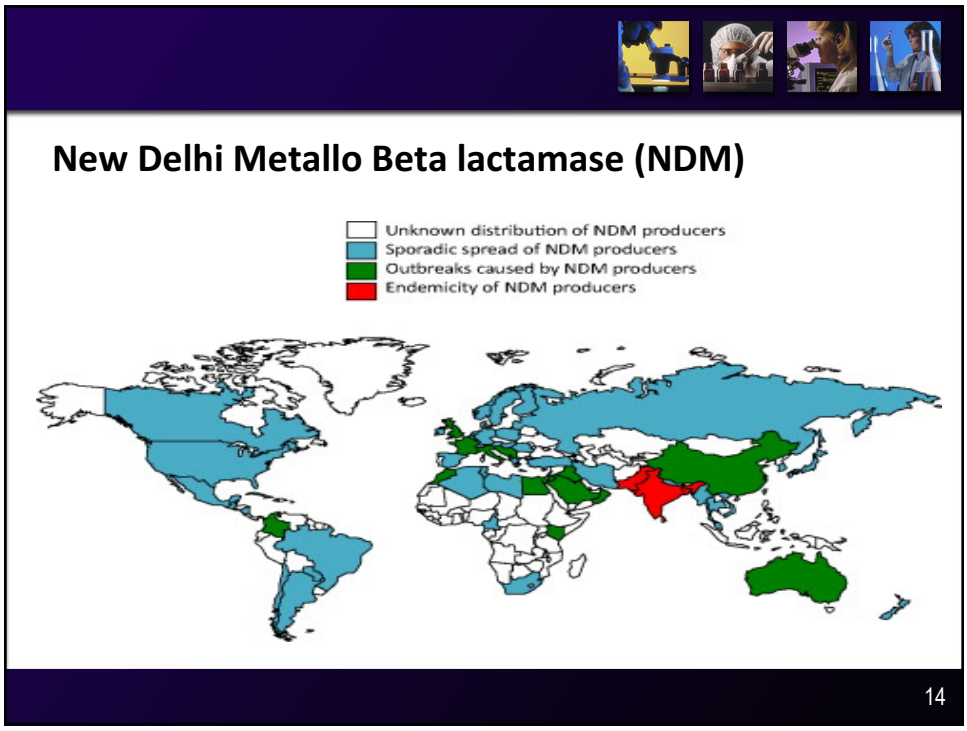
INICC Report 2010-2015. Accepted and In Press, American Journal Infection Control (AJIC) 2016

International Nosocomial Infection Control Consortium (INICC) report, data summary of 50 countries for 2010- 2015, Device-associated Module

Victor Daniel Rosenthal[1], Hail M. Al- Abdely[2], Anani Ali El-Kholy[3], Safa A. Aziz AlKhawaja[4], Hakan Leblebicioglu[5], Yatin Mehta[6], Vineya Rai[7], Nguyen Viet Hung[8], Souha Sami Kanj[9], Mona Foda Salama[10], Estuardo Salgado-Yepez[11], Naheed Elahi[12], Rayo Morfin Otero[13], Aracelis Apisarnthanarak[14], Braulio Matias De Carvalho[15], Ider Bat-Erdene[16], Dale Fisher[17], Maria Carmen S.G. Buenaflor[18], Michael M. Patow[19], Ana Marcela Quesada-Mora[20], Farid Zand[21], Vardatas Gurskis[22], Tanja Arguseva[23], Aamer Ikram[24], Daisy Aguilar de Moros[25], Wieslawa Duszynska[26], Nepomuceno Meja[27], Florin George Horhat[28], Vladislav Rebisky[29], Vesna Miodjevic[30], Gabriela Di Silvestre[31], Katarina Furova[32], Gloria Y. Ramos-Ortiz[33], May Osman Gamar Elaobya[34], Hindra Irawan Satari[35], Umesh Gupta[36], Tarek Dendane[37], Lal Reka[38], Humberto Guanche-Garcell[39], Bijie Hu[40], Denis Padgett[41], Kushlani Jayatilleke[42], Ben Jaballah Najla[43], Eleni Apostolopoulou[44], Walter Enrique Prudencio Leon[45], Alejandra Sepulveda-Chavez[46], Hector Miguel Telechea[47], Andrew Trotter[48], Carlos Alvarez-Moreno[49], Luis Kushner-Davalos[50]
Here only fit till 50 authors (one per country)

12


Emergence of a new antibiotic resistance mechanism in India, Pakistan, and the UK: a molecular, biological, and epidemiological study
Lancet August 11, 2010
Karthikeyan K Kumarasamy, Mark A Toleman, Timothy R Walsh, Jay Bagaria, Fafhana Butt, Ravikumar Balakrishnan, Uma Chaudhary, Michel Doumith, Christian G Giske, Seema Irfan, Padma Krishnan, Anil V Kumar, Sunil Maharjan, Shazad Mushtaq, Tabassum Noorie, David L Paterson, Andrew Pearson, Claire Perry, Rachel Pike, Bhargavi Rao, Ujjwayini Ray, Jayanta B Sarma, Madhu Sharma, Elizabeth Sheridan, Mandayam A Thirunarayan, Jane Turton, Supriya Upadhyay, Marina Warner, William Welfare, David M Livermore, Neil Woodford
Gram-negative Enterobacteriaceae with resistance to carbapenem conferred by NDM-1 are potentially a major global health problem
13


New Delhi Metallo Beta lactamase (NDM)
Unknown distribution of NDM producers
Sporadic spread of NDM producers
Outbreaks caused by NDM producers
Endemicity of NDM producers
14

NDM-1

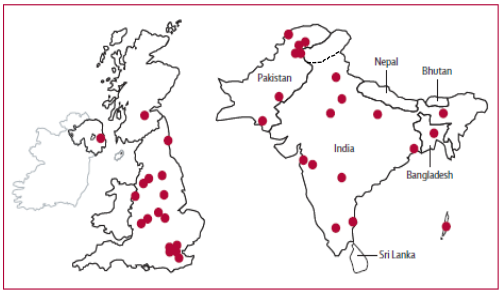


Figure 5: Distribution of NDM-1-producing Enterobacteriaceae strains in Bangladesh, Indian, Pakistan, and the UK

- **25 isolates from 8 cities of Pakistan**

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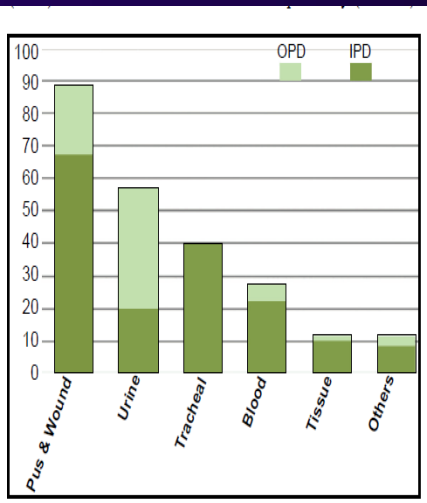

Fig 1. Frequency of *Acinetobacter* spp isolated from various clinical samples of in patients and outpatients (n=232)

Table 2: Antibiotics resistance profile of *Acinetobacter* spp. in various clinical samples

Antimicrobial	n	% Resistant
Co-trimoxazole	206	69.4
Piperacillin - tazobactam	168	66
Cefotaxime	229	65.9
Ciprofloxacin	225	60.8
Ceftazidime	238	58.8
Amikacin	226	52.6
Cefoperazone/sulbactam	185	46.4
Imipenem	231	45.4
Meropenem	231	45.4
Tigecycline	70	32.8
Tobramycin	162	16.0
Polymyxin B	147	11.5

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Emergence of Resistance in Clinical Settings; Community

Neisseria gonorrhea

MTB, MDR-TB, XDR-TB

Neisseria meningitides

Salmonella Typhi

RESEARCH ARTICLE

Emergence of an Extensively Drug-Resistant *Salmonella enterica* Serovar Typhi Clone Harboring a Promiscuous Plasmid Encoding Resistance to Fluoroquinolones and Third-Generation Cephalosporins

Elizabeth J. Klemm,[a] Sadia Shakoor,[b] Andrew J. Page,[a] Farah Naz Qamar,[b] Kim Judge,[a] Dania K. Saeed,[b] Vanessa K. Wong,[c] Timothy J. Dallman,[d] Satheesh Nair,[d] Stephen Baker,[e,f,g] Ghazala Shaheen,[b] Shahida Qureshi,[b] Mohammad Tahir Yousafzai,[b] Muhammad Khalid Saleem,[b] Zahra Hasan,[b] Gordon Dougan,[a,c] Rumina Hasan[b]

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Emergence of Resistance in Clinical Settings; Health Care Settings

Journal List › PLoS Pathog › v.13(5): 2017 May › PMC5436850

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PLoS Pathog. 2017 May; 13(5): e1006290. PMCID: PMC5436850
Published online 2017 May 18. doi: 10.1371/journal.ppat.1006290

***Candida auris*: A rapidly emerging cause of hospital-acquired multidrug-resistant fungal infections globally**

Anuradha Chowdhary,[1,*] Cheshta Sharma,[1] and Jacques F. Meis[2,3]

Deborah A. Hogan, Editor

PLoS

Colistin resistant GNR

MRSA/VRE

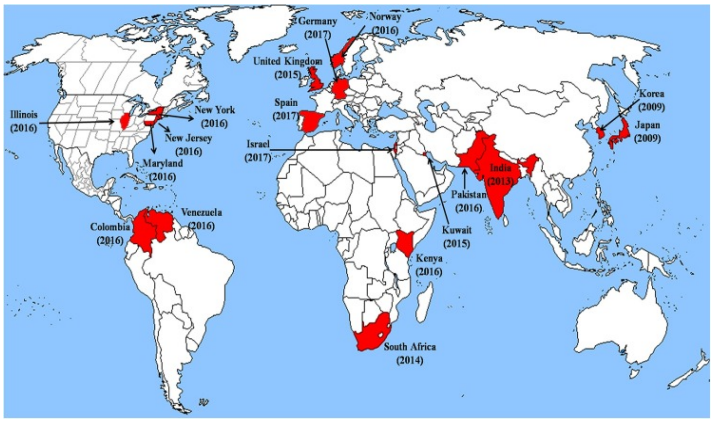
Pan R *Ps. aeruginosa*

MDR & XDR GNR

Candida auris

18

Candida auris: A rapidly emerging cause of hospital-acquired MDR fungal infections globally



PLoS Pathog. 2017 May; 13(5)

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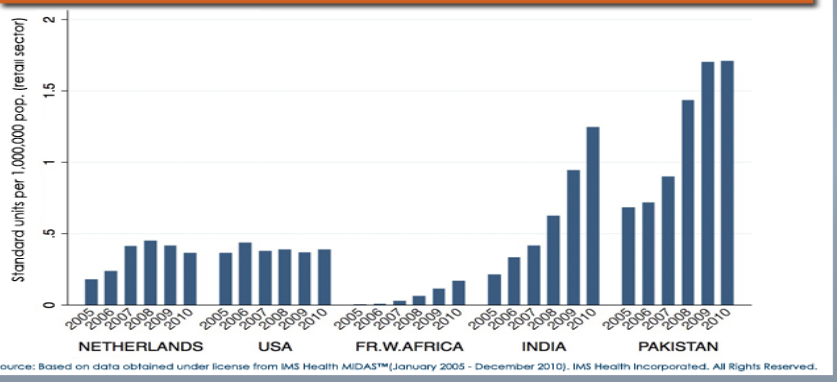
Retail sales of carbapenem antibiotics to treat Gram-negative bacteria are increasing rapidly in India and Pakistan



CDDEP THE CENTER FOR Disease Dynamics, Economics & Policy
WASHINGTON DC • NEW DELHI

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Length of Stay in ICU

	n	Mean LOS	SD	Extra LOS
Control	236	4.31	+/- 2.66	
HAI	120	15.73	+/- 12.69	11.42
VAP	54	21.89	+/- 14.97	17.58
CLABSI	32	25.88	+/- 17.95	21.57
CAUTI	44	18.04	+/- 15.24	13.73

*Surveillance of device-associated infections in intensive care units of a tertiary care hospital. **JIH** 2016*

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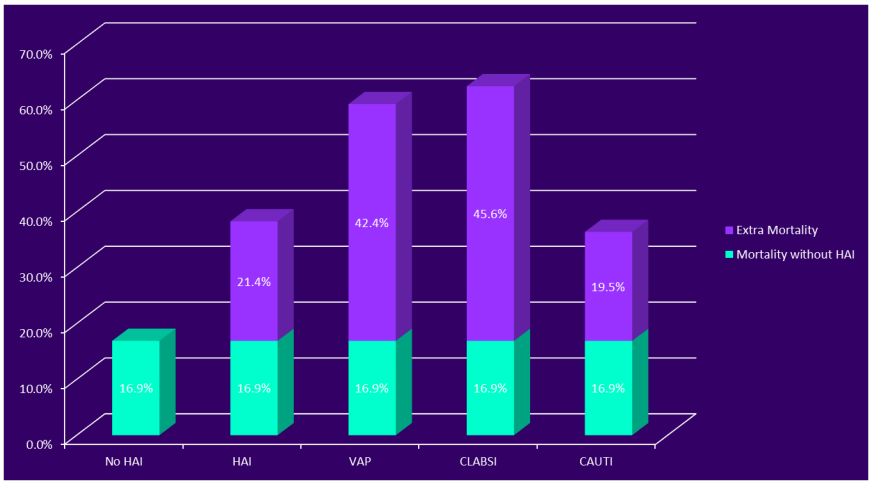
Mortality Rate in ICU



*Surveillance of device-associated infections in intensive care units of a tertiary care hospital. **JIH** 2016*

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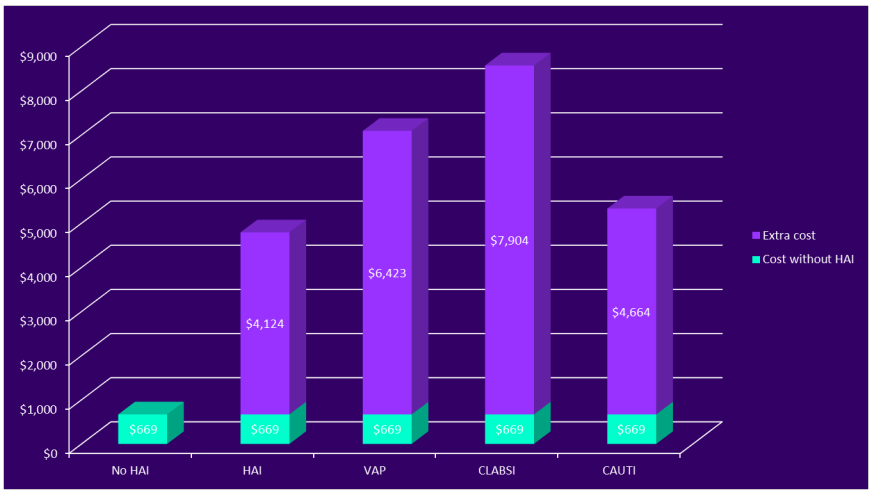
Total Hospital Cost per Patient



Surveillance of device-associated infections in intensive care units of a tertiary care hospital. ***JIH*** *2016*

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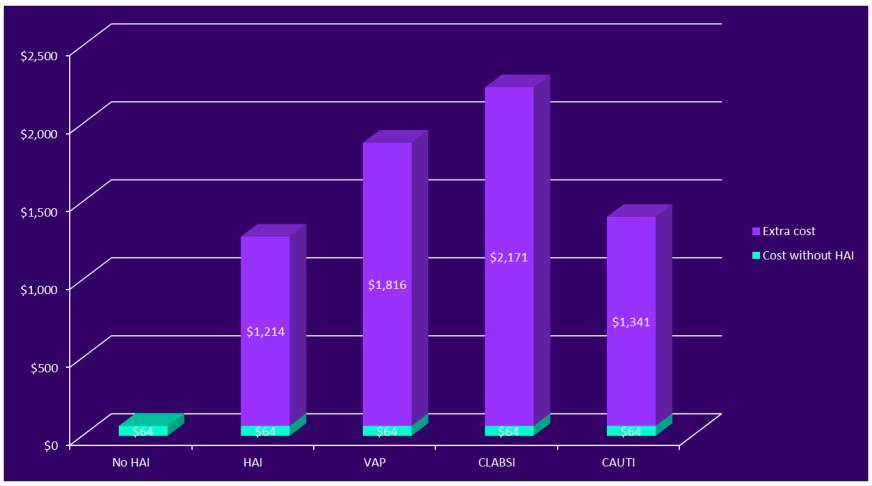
Extra Antibiotic Cost Per Patient



Surveillance of device-associated infections in intensive care units of a tertiary care hospital. ***JIH*** *2016*

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Areas of Concern

- Legislative coverage
- Guidelines, policies
- IPC programs
- Oversight
- Training opportunities
- Infectious waste management
- Antimicrobial usage
- Clinical Auditing
- Multifaceted approach

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Why infection control is important?

- Prevents transmission of infections
- Shortens patient's stay in the hospital
- Decreases hospitalization cost
- Reduces morbidity and mortality
- Containment of AMR
- An indicator of safe care to patient

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Factors involved in HAI

- The micro-organisms
- The host (patient)
- The carriers (Staff)
- The environment
- Treatment

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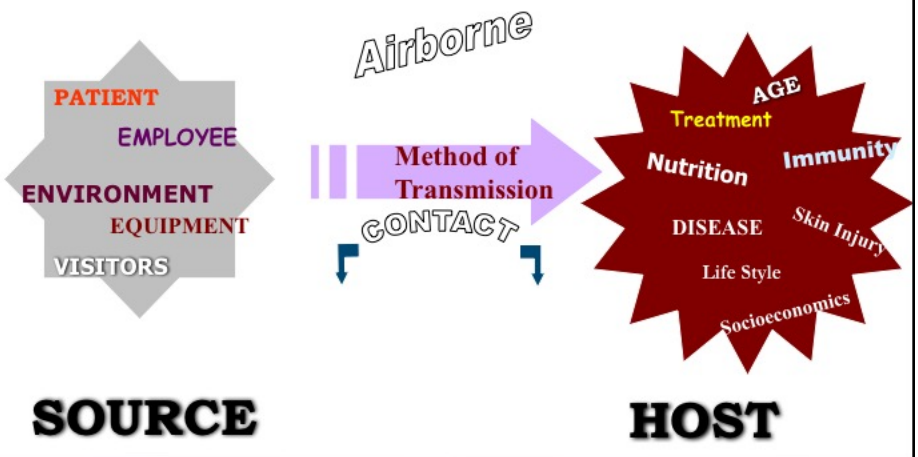
Chain of Infection



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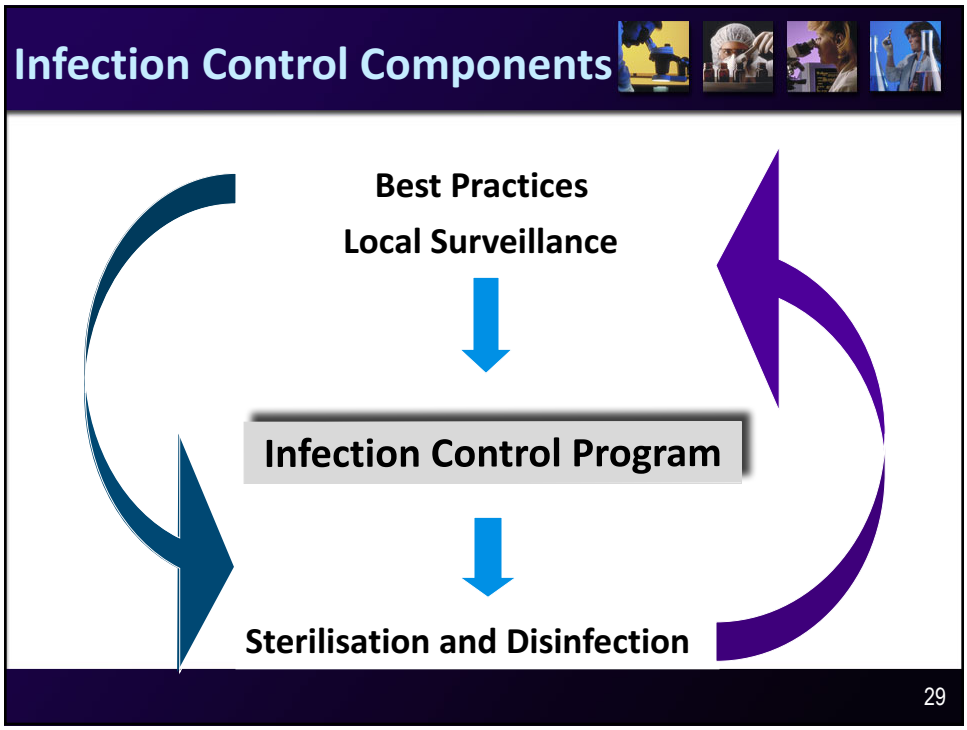
Infection Control Components
Best Practices
Local Surveillance
Infection Control Program
Sterilisation and Disinfection
29


Infection Control Activities
• Surveillance & trends
• Monitoring methods of control
• Identification & Outbreak investigation
• Advice: day to day, isolation, liaison, prevention
• Management of injuries
• Auditing
• Staff Education/Immunization
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? Responsibility

- Infection Control Committee
  - Infection Control team
    - Core group
- HCW
- Medical officers
- Nursing staff

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Infection Control is Everyone's Business

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Preventive Measures

- Interruption of transmission of microorganisms
  - Care of equipment
- Interruption of person to person transmission
  - Hand washing
  - Barrier precautions

33

Why We Wash Our Hands ?

Clean Hands are Healers
Dirty Hands are Killers

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HYGIENE IN PRACTICE
حفظانِ صحت کے اُصول
EFFECTIVE HAND WASHING TECHNIQUE FOR HEALTHCARE WORKERS
تمام حفظانِ صحت کے کارکنان کے لئے ہاتھ دھونے کا صحیح طریقہ
1
Wet hand thoroughly with water. Take one measure of cleanser.
ہاتھوں کو پانی سے گیلا کرنے کے بعد ہینڈواشنگ پروڈکٹس استعمال کریں۔
2
Rub hands palm to palm.
ہتھیلیوں کو آپس میں اچھی طرح رگڑیں۔
3
Right hand over back of left. Change hand and repeat the process.
دائیں ہاتھ کی ہتھیلی سے بائیں ہاتھ کی پشت کو صاف کریں۔
اسی طرح دوسرے ہاتھ سے اسی عمل کو دھرائیں۔
4
Fingers linked in palms.
دائیں ہاتھ کی انگلیوں کو بائیں ہاتھ سے صاف کریں
پھر دوسرے ہاتھ سے اس عمل کو دھرائیں۔
5
Rotate right hand around left thumb. Change hands and repeat.
دائیں ہاتھ سے بائیں ہاتھ کے انگوٹھے کو صاف کریں
اور پھر اس عمل کو دوسرے ہاتھ پر دھرائیں۔
6
Rotate right hand around left wrist upto forearm. Change hand and repeat. The Hands are finally washed under running water.
آخر میں دائیں ہاتھ سے بائیں ہاتھ کی کلائی کو کہنی تک صاف کریں
اور اسی طرح اس عمل کو دوسرے ہاتھ پر دھرائیں۔
آخر میں ہاتھوں کو صاف پانی سے دھولیں۔
Incase of applying MediHex 05 do not wash your hands with water.
MediHex 05 استعمال کرنے کی صورت میں پانی استعمال نہ کریں۔
Break the chain and stop the spread of infections. Wash your hands.
MediClean HAND CLEANSER
MediHex-4 SCRUB SOLUTION 4% Chlorhexidine Digluconate BP
MediHex 05 HAND RUB 0.5% Chlorhexidine Digluconate BP in 70% IPA
MEDICHEM INTERNATIONAL
A public service message by
unipron


Infectious waste
BIOHAZARD
36

Sharps

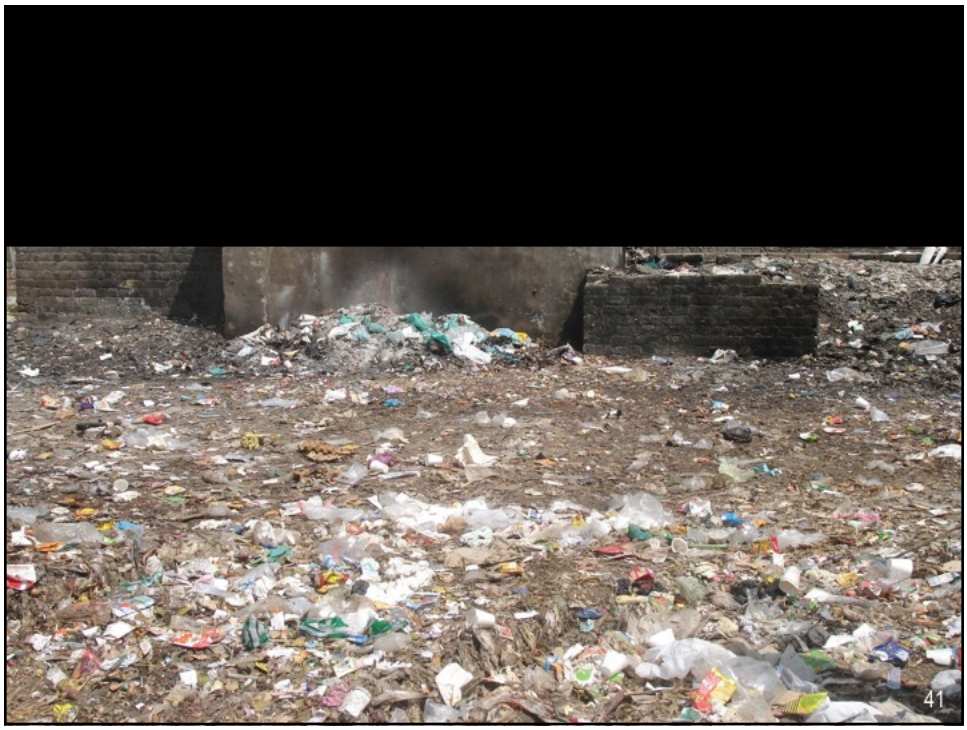
37

Infectious waste

38


INCINERATOR
BURN IT UP!
39


40



Harsh Fact

- **Antibiotic prescribing**
  - 35% of the total healthcare budget is spent on antimicrobials in developing countries versus 11% in developed countries
- **Antibiotics are now "endangered species" facing extinction due to the worldwide emergence of antibiotic resistance**

Microbiol., 23 November 2016 https://doi.org/10.3389/fmicb.2016.01881

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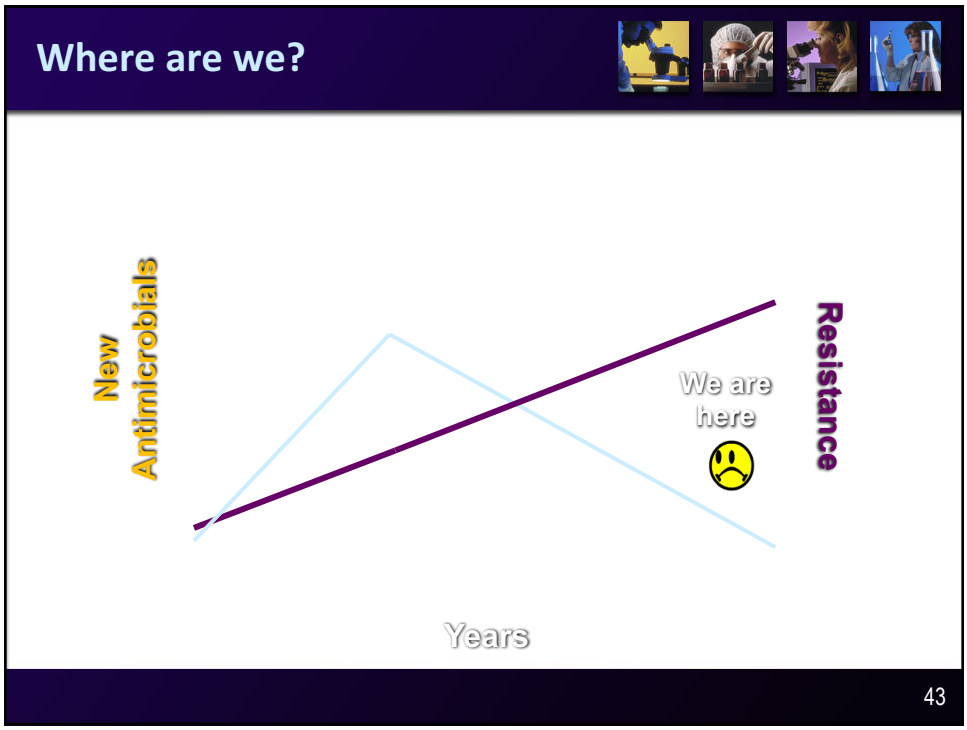
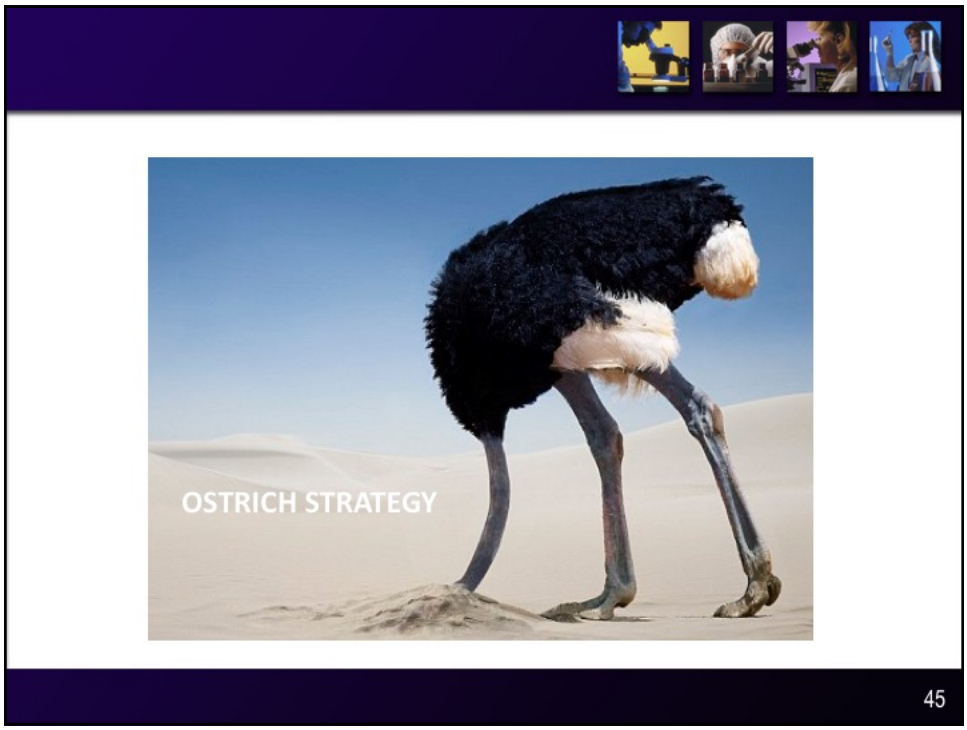
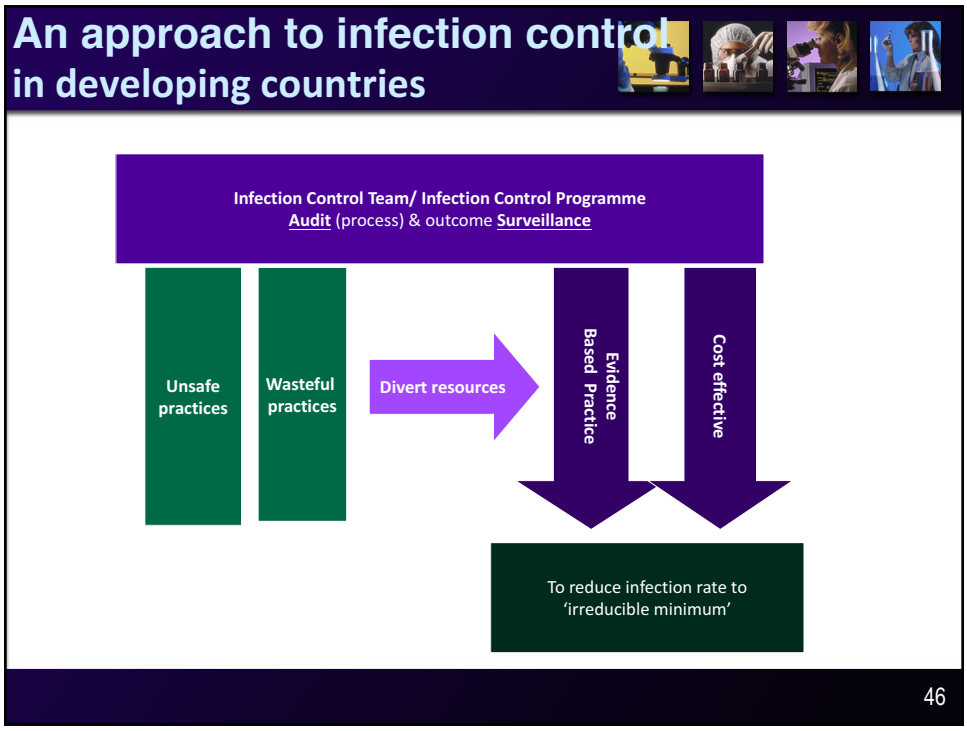

Where are we?
New Antimicrobials
Resistance
We are here
Years
43


Compliance < 40%
44


OSTRICH STRATEGY
45


An approach to infection control in developing countries
Infection Control Team/ Infection Control Programme
Audit (process) & outcome Surveillance
Unsafe practices
Wasteful practices
Divert resources
Evidence Based Practice
Cost effective
To reduce infection rate to 'irreducible minimum'
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Prioritizing risks

SEVERITY

High severity Low frequency (Blood stream infections)	High severity High frequency (Blood-borne Infections from re-use of syringes & needles)
Low severity Low frequency (Infections from linen)	Intermediate severity High frequency (Surgical site infections)

FREQUENCY

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Cost Saving Measures

- Routine
  - Microbiological Swabbing of environment
  - Disinfectants for environmental cleaning e.g. floors & walls
  - Fumigation of isolation room with formaldehyde
- Unnecessary
  - Use of overshoes and dust attracting matt
  - Personal Protective Equipment in the Intensive Care, & Neonatal Unit
- Excessive/unnecessary use of
  - IM/IV injections
  - Insertion of indwelling devices e.g. IV lines, urinary catheters, nasogastric tube
  - Antibiotics both for prophylaxis and treatment

Damani NN. Journal of Hospital infection 2007; 65(S1): 151-154.

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Cost Effective Practices

- Education and practical training in
  - Hand hygiene
  - Aseptic technique
  - Appropriate use of PPE
  - Sharp use and disposal in robust containers
- Provision of alcoholic hand rub and hand washing facilities for hand hygiene
- Use of adequately sterile items for invasive procedures
- Use of single-use disposable sterile needles and syringes
- Adequate decontamination of items/equipment between patients
- Provision of Hep B vaccination for healthcare workers
- Post exposure management of healthcare workers

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Containment of AMR

Requires Global Efforts

International level

- WHO Containment of AMR 2015
  - (Global Action Plan for AMR)
- UN general Assembly high level meeting on AMR 2016
- Collaboration between countries; GARP

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WHO Initiatives

- Increased collaboration between governments, nongovernmental organizations, professional groups and international agencies
- Networking that undertake surveillance of antimicrobial use and AMR
- International approach for control of counterfeit drugs
- Incentives for R&D for new drugs and vaccines
- Forming new, and reinforcing existing programmes to contain AMR

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Regional Initiatives

- Regional Committee meeting in Timor Leste 2015
  - Member states passed a key resolution for steadfast political commitment and multi-sectoral coordination to tackle AMR
- Jaipur Declaration 2011 on AMR
  - Calls for comprehensive action against the irrational use of antibiotics
- Berlin declaration 2017
  - G20 health ministers in 2017 recognized the increasing threat of AMR
  - Members pledged to develop national action plans to tackle AMR, in line with the One Health approach, with interventions aimed at agriculture, livestock, and human health

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Containment of AMR

- National
  - Joint policies/guidelines from health ministry, agriculture & environment
  - National policy implementation
  - Advocacy and dissemination of information
- Role of professional bodies
- Community and Individual
- Public Private Partnership

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National Strategies

National Committee to work in coordination with regulatory bodies:

- AMR surveillance & antimicrobial utilization
- Evaluate the impact of AMR preventive and control strategies
- Register all dispensing outlets
- Ensure availability of antimicrobials with prescription only
- Bind legally all manufacturers to report data on antimicrobial distribution
- Enhance coverage of immunization
- Develop national action plans and allocate resources

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Community Level

- IC in community (Public Health)
  - Hand washing
  - Sanitation
  - Clean drinking water (chlorination)
  - Immunization

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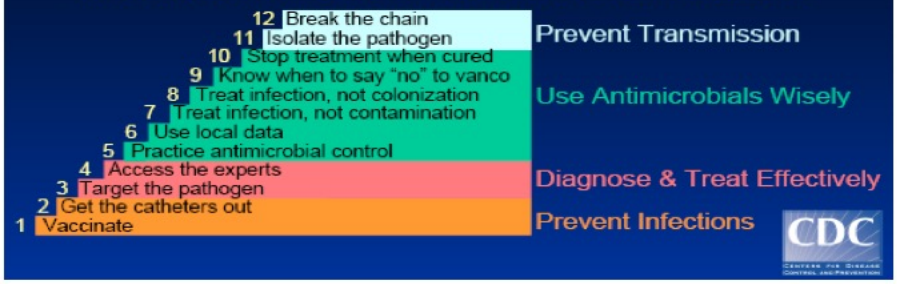
Health Care Settings Level

Establish an IPC Committee

12 Steps to Prevent Antimicrobial Resistance: Hospitalized Adults

Clinicians hold the solution…
Take steps NOW to prevent antimicrobial resistance!



Good Microbiology Practices

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Laboratory Level

Laboratory and its Role in Containment of AMR

Good Laboratory Practice

AMR Surveillance

Early identification of microorganisms
and fast reporting of antimicrobial susceptibility result

Laboratory Quality Management System
Laboratory Information System
Data Management and Analysis

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Clinical bacteriology in low-resource settings: today's solutions

Sien Ombelet, Jean-Baptiste Ronat*, Timothy Walsh, Cedric P Yansouni, Janneke Cox, Erika Vlieghe, Delphine Martiny, Makeda Semret, Olivier Vandenberg, Jan Jacobs, on behalf of the Bacteriology in Low Resource Settings working group†*

Low-resource settings are disproportionately burdened by infectious diseases and antimicrobial resistance. Good quality clinical bacteriology through a well functioning reference laboratory network is necessary for effective resistance control, but low-resource settings face infrastructural, technical, and behavioural challenges in the implementation of clinical bacteriology. In this Personal View, we explore what constitutes successful implementation of clinical bacteriology in low-resource settings and describe a framework for implementation that is suitable for general referral hospitals in low-income and middle-income countries with a moderate infrastructure. Most microbiological techniques and equipment are not developed for the specific needs of such settings. Pending the arrival of a new generation diagnostics for these settings, we suggest focus on improving, adapting, and implementing conventional, culture-based techniques. Priorities in low-resource settings include harmonised, quality assured, and tropicalised equipment, consumables, and techniques, and rationalised bacterial identification and testing for antimicrobial resistance. Diagnostics should be integrated into clinical care and patient management; clinically relevant specimens must be appropriately selected and prioritised. Open-access training materials and information management tools should be developed. Also important is the need for onsite validation and field adoption of diagnostics in low-resource settings, with considerable shortening of the time between development

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PERSPECTIVE

Delivering on Antimicrobial Resistance Agenda Not Possible without Improving Fungal Diagnostic Capabilities

David W. Denning, David S. Perlin, Eavan G. Muldoon, Arnaldo Lopes Colombo, Arunaloke Chakrabarti, Malcolm D. Richardson, Tania C. Sorrell

Antimicrobial resistance, a major public health concern, largely arises from excess use of antibiotic and antifungal drugs. Lack of routine diagnostic testing for fungal diseases exacerbates the problem of antimicrobial drug empiricism, both antibiotic and antifungal. In support of this contention, we cite 4 common clinical situations that illustrate this problem: 1) inaccurate diagnosis of fungal sepsis in hospitals and intensive care units, resulting in inappropriate use of broad-spectrum antibacterial drugs in patients with invasive candidiasis; 2) failure to diagnose chronic pulmonary aspergillosis in patients with smear-negative pulmonary tuberculosis; 3) misdiagnosis of fungal asthma, resulting in unnecessary treatment with antibacterial drugs instead of antifungal drugs and missed diagnoses of life-threatening invasive aspergillosis in patients with chronic obstructive

accelerating efforts with multipronged approaches tailored to individual countries and healthcare settings. Even if the difficult task of developing new antimicrobial drugs is successful, current efforts aimed at reducing the development of resistance will need to be maintained to protect these novel compounds.

A central tenet of controlling AMR is antibiotic drug stewardship, which seeks to limit inappropriate antibiotic drug usage by avoiding unnecessary prescribing, including discontinuing antibiotic therapy if it is not required. Within the context of stewardship programs, inadequate attention has been paid to fungal infection as the cause of antibacterial treatment failure. Furthermore, the importance of the accurate and timely diagnosis of fungal infections in

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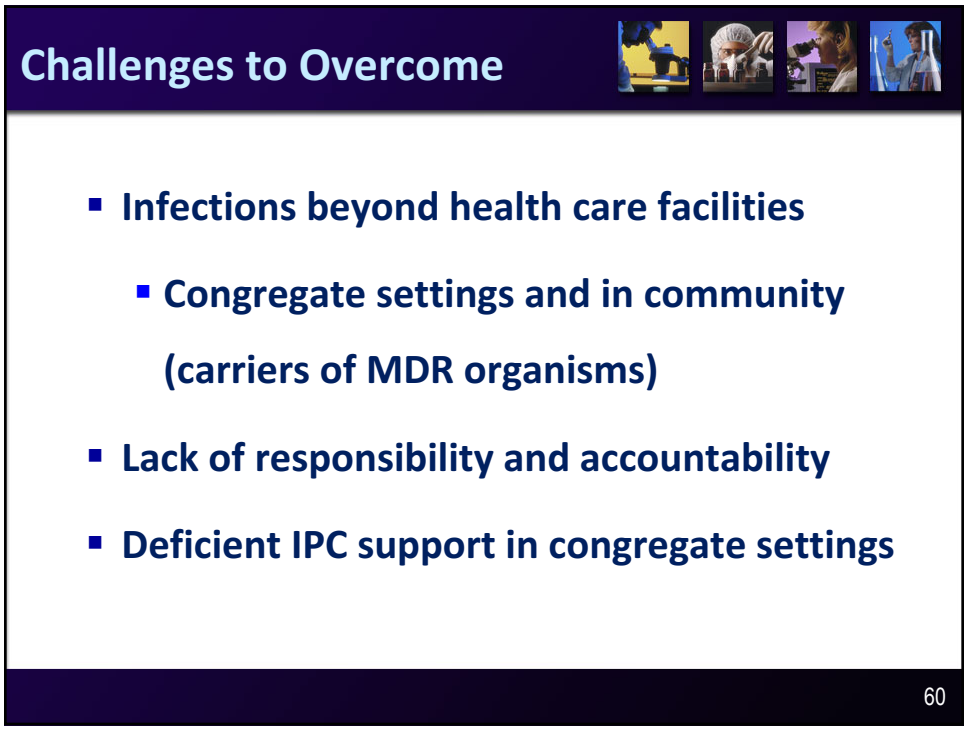

Challenges to Overcome

- Infections beyond health care facilities
  - Congregate settings and in community (carriers of MDR organisms)
- Lack of responsibility and accountability
- Deficient IPC support in congregate settings

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Way Forward

- Infection Prevention & Control Program
- Diagnostic Stewardship
- Antibiotic Stewardship
- Risk assessment of AMR in the food chain, environment in a public health perspective
- A higher profile research on IC and AMR in health care settings
- Enough funding for research to address current gaps

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Good Infection Control Practices

- Aseptic technique for all sterile procedures
- Remove indwelling devices when no longer needed
- Isolation of patient with communicable diseases/multi-resistant organism
- Placing mechanically ventilated patients in a semi-recumbent position
- Minimize number of people in OT
- Staff education and training

Damani NN. Journal of Hospital infection 2007; 65(S1): 151-4

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Policies

- Policy for hand hygiene
- Policy of Hepatitis B vaccination
- Disinfectant policy
- Needle stick injury policy
- Waste management policy

63

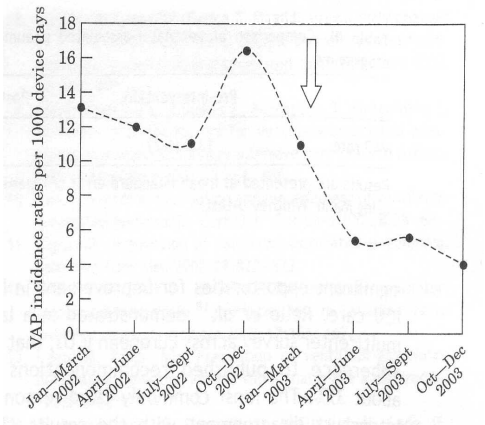
Impact of Staff Education Programme on Ventilator-associated Pneumonia

Reduction in incidence of VAP from 13.2 to 6.5 episodes /1000 ventilator days

Salahuddin N *et al. J Hosp Infect* 2004;57: 223-227

Reduction in incidence of VAP from 12.6 to 5.7 episodes /1000 ventilator days

Zack JE, *Crit Care Med.* 2002;30:2407-2412



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SENIC

Study on the Efficacy of Nosocomial Infection Control

- 1 infection control nurse per 200 to 250 beds
- 1 hospital epidemiologist per hospital (1000 beds)
- Organized surveillance for nosocomial infections
- Feedback of nosocomial infection rates

Haley RW et al. Am J Epidemiol 1985;121(2):182-205

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IC– Quarterly Report

1. Period : _____
2. Hospital / Institute: _____
3. Hospital Classified as: _____
4. In Charge _____

5. <u>Infection Control Committee:</u>

Composition

- President: _____
- No. of Members: _____
- Administrative Officer member ICC: _____
- Nursing Officer member ICC: _____
- Is any of the sanitary staff member: _____

Last infection control meeting held on: _____

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INFECTION CONTROL – QUARTERLY REPORT

1. Period : _____
2. Hospital / Institute: _____
3. Hospital Classified as: _____
4. Commandant / Commanding Officer _____

5. **Infection Control Committee:**
   a. Composition
      1) President: _____
      2) No. of Members: _____
      3) Is 2 IC/ Adm Offr member of ICC: _____
      4) Is any AFNS offr member of ICC: _____
      5) Is any of the sanitary staff member: _____
   b. Last infection control meeting held on: _____

6. **Diagnostic Facilities:**
   a. Facilities adequate for bacteriological culture: _____
   b. No. of specimens processed for culture during the qtr: _____
   c. Number of overall positive cultures: _____
   d. Can MRSA be detected in the lab: _____
   e. If yes, no. of MRSA isolated during the qtr: _____
   f. Can ESBL be detected in the lab: _____
   g. If yes, no. of ESBL isolated during the qtr: _____
   h. Can VRE be detected: _____
   j. If yes, no. of VRE isolated during the qtr: _____

7. **Infectious cases:**
   a. No. of infectious (notifiable) cases admitted: _____
   b. No. of hospital acquired infections: _____
   c. Isolation facilities adequate: _____
   d. Number of isolation beds available in the hosp _____

8. **Antimicrobials**
   a. Total LP expenditure on antimicrobials: _____
   b. Expenses incurred on purchase of:
      1) Vancomycin/Teicoplanin _____
      2) Imipenem / Meropenem _____
      3) Sulzone / Tazocin _____
   c. Is there any antibiotic policy: _____

9. **Infection Control Measures:**
   a. MRSA protocol available with wards/lab: _____
   b. Adequate hand washing facilities exist:
      1) In wards _____
      2) In OPDs _____
   c. Alcohol scrub/hand disinfectant avail at washing area: _____

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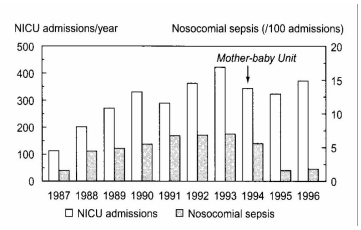
Nosocomial infections in NICU

- Active involvement of mother in regular monitoring of babies
- Strict hand washing before and after handling babies
- Co-bedding of mother and infant (use of a heated cot as required & minimum use of incubators)
- Encourage breast feeding (less need for Parenteral feeding)
- All procedures were undertaken by trained nurse
- Minimal visitors



Bhutta ZA. et al. 1997 & Bhutta ZA. et al. BMJ 2004;329:1151-5

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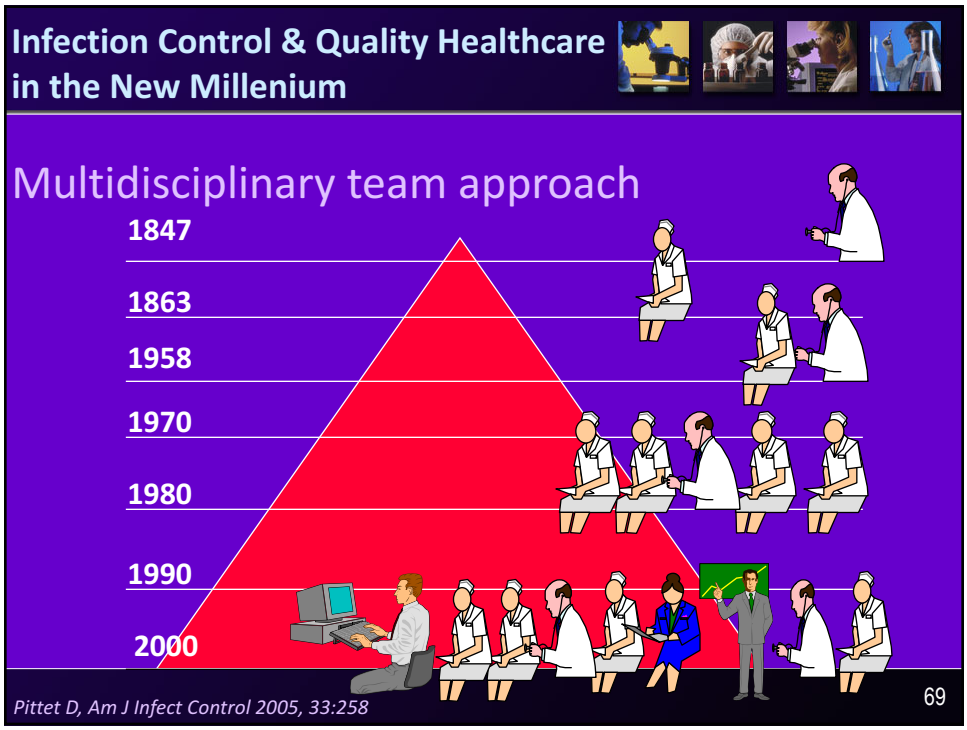
Infection Control & Quality Healthcare in the New Millenium
Multidisciplinary team approach
1847
1863
1958
1970
1980
1990
2000
Pittet D, Am J Infect Control 2005, 33:258
69


Message
BEWARE
Continuous surveillance
Judicious antibiotic monitoring
Proper infection control policies
Strict implementation
Stringent sterilization & disinfection
Regular auditing
Efficient Infection control network
Apposite waste disposal
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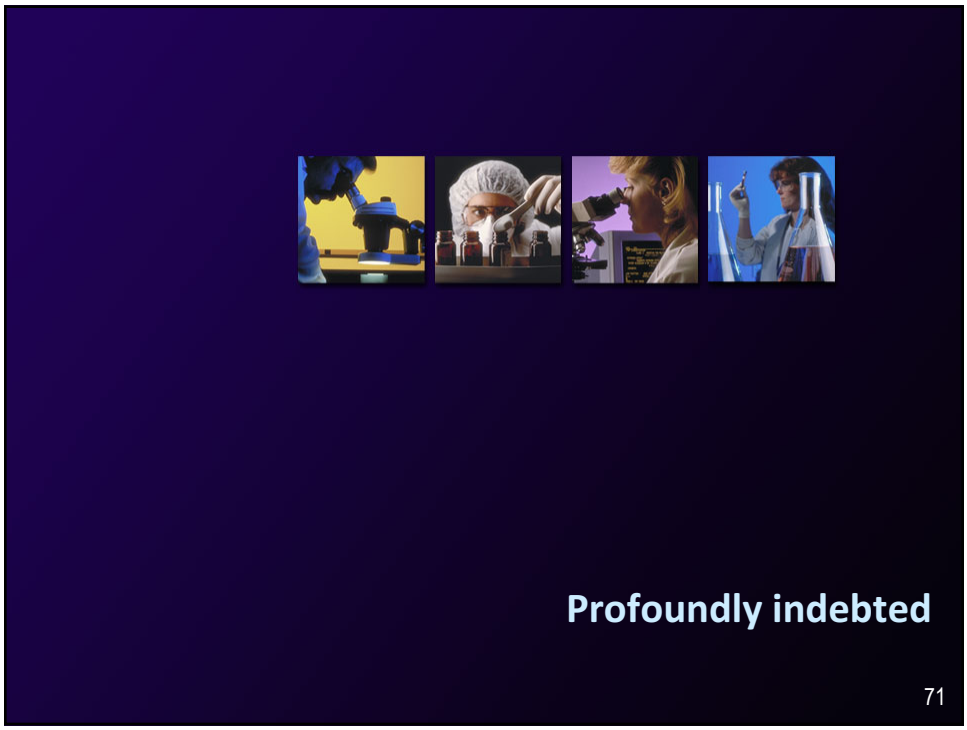

www.webbertraining.com/schedulep1.php	
July 19, 2018	FLOOD REMEDIATION IN HEALTHCARE FACILITIES – INFECTION CONTROL IMPLICATIONS Speaker: **Michael Buck**, University of Minnesota
August 16, 2018	*(FREE Teleclass)* INTERPRETING RESEARCH EVIDENCE: A KEY SKILL FOR INFECTION CONTROL PROFESSIONALS Speaker: **Prof. Donna Moralejo** , Memorial University School of Nursing, Newfoundland
September 6, 2018	MOLECULAR DIAGNOSTICS AND ITS ROLE IN INFECTION PREVENTION Speaker: **Sanchita Das**, University of Chicago
September 13, 2018	*(FREE Teleclass)* NEONATAL SEPSIS PREVENTION IN LOW-RESOURCE SETTINGS Speaker: **Prof. Dr Angela Dramowski**, Stellenbosch University, Cape Town
September 20, 2018	THE SILENT TSUNAMI OF AZOLE-RESISTANCE IN THE OPPORTUNISTIC FUNGUS *ASPERGILLUS FUMIGATUS (postponed)* Speaker: **Prof. Paul E. Verweij**, Radboud University Center of Expertise in Mycology, The Netherlands
September 27, 2018	CHLORHEXIDINE USE AND BACTERIAL RESISTANCE Speaker: **Prof. Jean Yves Maillard**, Cardiff University, Wales


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