Infection control in developing countries

Dr Nizam Damani
Clinical Director : Infection Prevention and Control
Craigavon Area Hospital, Portadwon
N. Ireland, UK

1

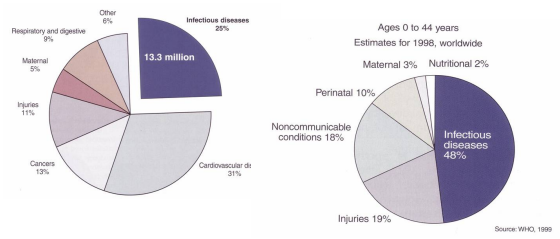
Outline

- Setting the scene
- Highlight the key issues
- Look at the possible solutions by applying basic infection control practices to reduce infections
- Conclusions

2

Leading causes of death

53.9 million from all causes, worldwide



3

Incidence of Healthcare associated infections

- Lack of reliable data affects estimates on the burden- millions worldwide every year
- No health-care facility, no country, no health-care system in the world is free of this problem
  - Developed world: 5–10% patients
  - Developing countries: risk is at least 2 times higher and can exceed 25%
  - ICU - 30% patients; attributable mortality as high as 44%

4

Infection control in developing countries

- None/inadequate Infection Control infrastructure
- Lack of strategic direction at national/local level
- Lack of resources/financial governance
- Well-organized, effective infection control programmes are confined to academic institutions, well-funded government and private hospitals
- Smaller hospitals in urban areas and hospitals in rural centres have less resources
  - None or inadequate infection control programme
  - Lack of Microbiology Laboratory supports
  - Availability of antimicrobial agents, hand hygiene products and hand washing facilities, Personal Protective Equipment and sterile goods

5

The Study on the Efficacy of Nosocomial Infection Control (SENIC Study)

- 6 % of infection can be prevented by *minimal* infection control efforts
- 32% could be prevented by a well organised & highly effective infection control programme

Haley RW.*Am J Epidemiol* 1985:121:182-205

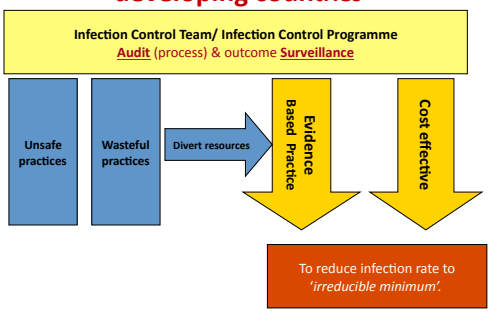
6

Even though infection rates can be drastically reduced in most hospitals in developing countries, the rates cannot be reduced below 5% unless excessive costs are incurred *'irreducible minimum'.*

Ayliffe GAJ: *Infection Control* 1986;7:92-95

7

An approach to infection control in developing countries



8

COST SAVING MEASURES

Unnecessary and wasteful practices

- 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.

9

COST SAVING MEASURES

Antibiotic prescribing

35% of the total healthcare budget is spent on antimicrobials versus 11% in developed countries.

Isturiz RE et al . *Infection Control Hospital Epidemiology* 2000;21:394-397

10

NO COST MEASURES

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
- Avoid unnecessary Per Vaginal (PV) examination in women in labour
- Placing mechanically ventilated patients in a semi-recumbent position
- Minimize number of people in operating theatre

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

11

LOW COST MEASURES

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

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

12

Setting Priority

- Identify *preventable* healthcare associated infections
- Target preventable HCAIs in *high priority areas*
- Require *minimum resources* with *maximum benefit*

13

Priority setting

Risk Factor = *Frequency* (Probability) X *Consequence* (Impact)

Surveillance/outbreaks data will give you the probability or *frequency* of infection from a task or a procedure

Risk assessment will give you impact *or consequence* to patient as a result of a task or a procedure.

14

Risk assessment

Identify Risk

- Identify tasks & activities that put patients, health workers & visitors at risk
- Quantify risk e.g. consequences can be classified into:
  1. Catastrophic 2. Major 3. Moderate & 4. Minor

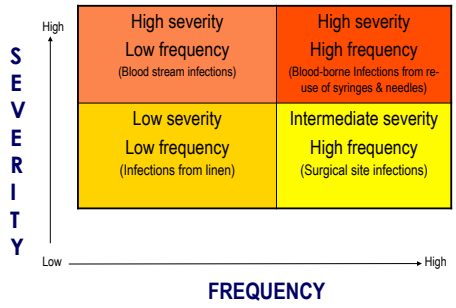
Risk Analysis

- Why are they are happening?
- How often they are happening?
- How much they are likely to cost?

Risk Management in NHS, 1993

15

Prioritizing risks



16

Effective and feasible interventions

17

Bangladesh

- Topical emollient therapy was used to improve the function of skin as a barrier against infections.
- Overall preterm babies treated with sunflower seed oil during the first few days/weeks of life were

  41% less likely to develop nosocomial infections.

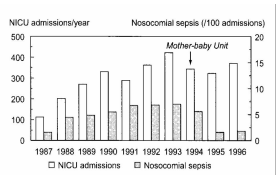
Damstadt GL *et al. Lancet* 2005

18

Nosocomial infections in the Neonatal care unit

(Aga Khan Hospital, Karachi, Pakistan)

- 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



Outcome

- Reduction in Nosocomial sepsis
- Reduction in Nursing staff

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

19

Neonatal sepsis among NICU

(University Hospital in Egypt)

- Increase rates of early onset neonatal sepsis among infants in ICU
- Mortality rates : 55%
- All infants placed on IV fluids and antibiotics

Yassin S. *et al* 5th IFIC Congress Malta, 2003

20

Neonatal sepsis among NICU

(University Hospital in Egypt)

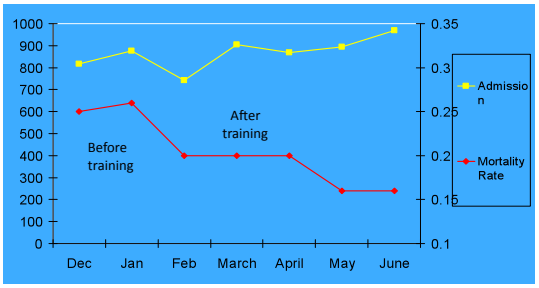
- Poor understanding of infection control
- Unsafe practices in the preparation of IV fluids
- Reuse of individual bags (multiple infants share one bag)
- Opened IV fluids: Contaminated with *Klebsiella* spp
- Unopened IV fluids: no growth
- NICU environmental surfaces: *Klebsiella* spp predominant

Yassin S. *et al* 5th IFIC Congress Malta, 2003

21

Admissions, Deaths and Mortality Rates

(Pre and post training)
(22 NICUs in Egypt :Dec 2001-June 2002)



Yassin S. *et al* 5th IFIC Congress Malta, 2003

22

Effect of hand washing on child health

Randomised controlled trial in Karachi, Pakistan.

Hand washing with soap and water

Children under age of 5 years

- 50% lower incidence of pneumonia

Children under age of 15 years

- 53% lower incidence of diarrhoea
- 34% lower incidence of impetigo

Luby SP *et al. Lancet* 2005; **366**: 225-33.

23

Impact of Staff Education Programme on Ventilator-associated Pneumonia

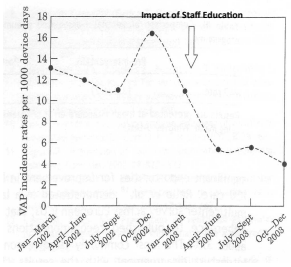
Aga Khan Hospital, Karachi, Pakistan

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



24

Conclusions

- Identify unsafe, unnecessary and ineffective infection control practices
- Divert resources to apply *basic* evidence based practice in Infection control
- Implement simple & effective solutions according to local need and resources which are achievable and affordable

Simple measures do save lives !

25

Thank you

26