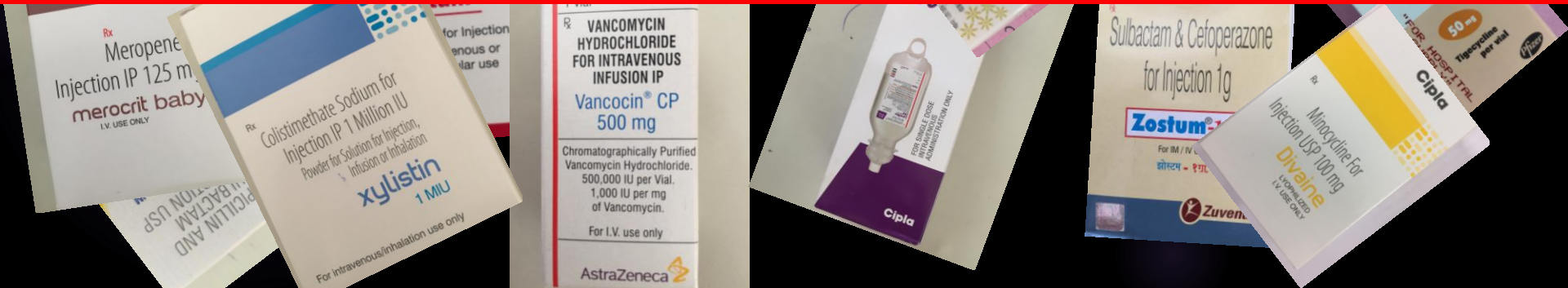
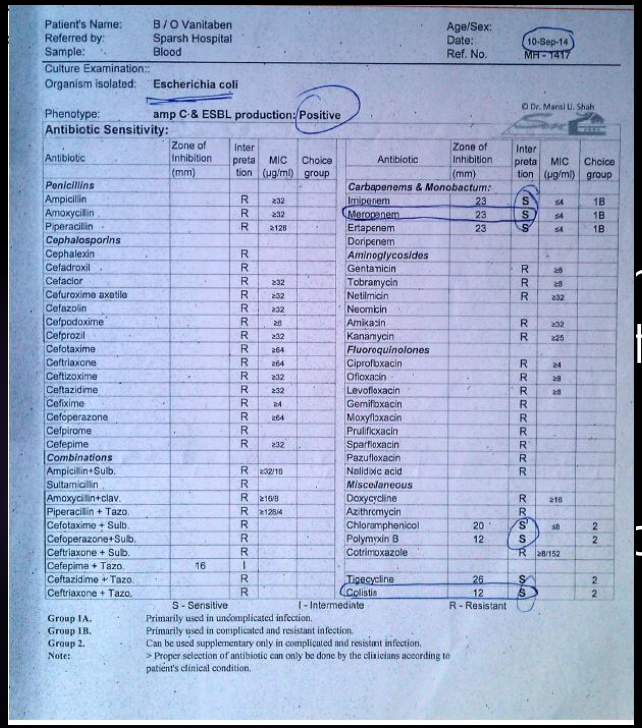
Which Antibiotics will work and which not in neonatal sepsis in INDIA ????



Real case scenario..



Patient's Name: B / O Vanitaben
Referred by: Sparsh Hospital
Sample: Blood
Age/Sex:
Date: 10-Sep-14
Ref. No. MH - 1417

Culture Examination::
Organism isolated: **Escherichia coli**

Phenotype: amp C & ESBL production: Positive

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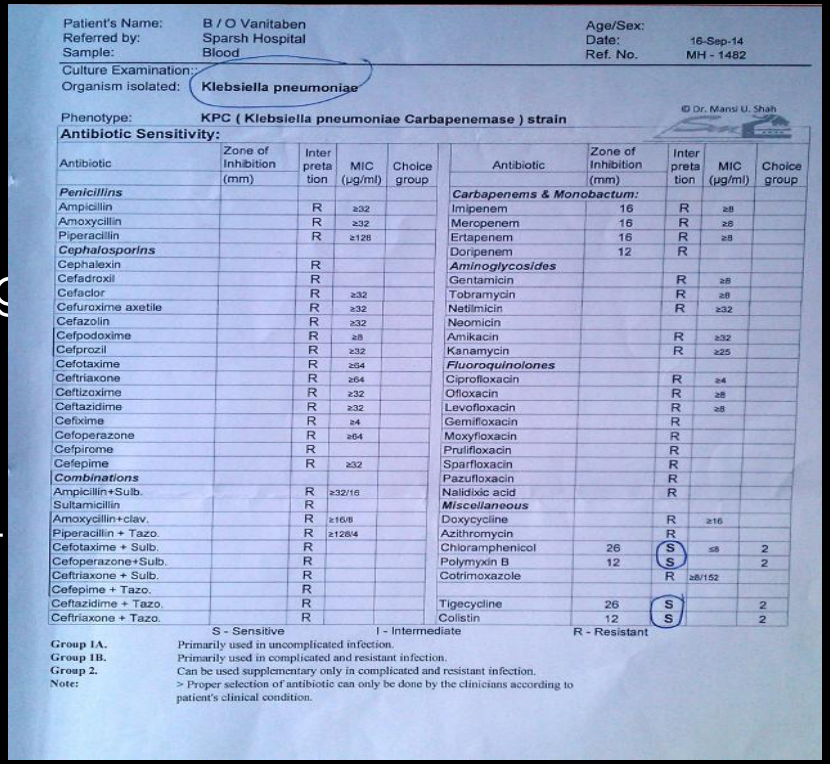
Antibiotic Sensitivity:

Antibiotic	Zone of Inhibition (mm)	Inter preta tion	MIC (µg/ml)	Choice group
Penicillins				
Ampicillin		R	≥32	
Amoxycillin		R	≥32	
Piperacillin		R	≥128	
Cephalosporins				
Cephalexin		R		
Cefadroxil		R		
Cefaclor		R	≥32	
Cefuroxime axetile		R	≥32	
Cefazolin		R	≥32	
Cefpodoxime		R	≥8	
Cefprozil		R	≥32	
Cefotaxime		R	≥64	
Ceftriaxone		R	≥64	
Ceftizoxime		R	≥32	
Ceftazidime		R	≥32	
Cefixime		R	≥4	
Cefoperazone		R	≥64	
Cefpirome		R		
Cefepime		R	≥32	
Combinations				
Ampicillin+Sulb.		R	≥32/16	
Sultamicillin		R		
Amoxycillin+clav.		R	≥16/8	
Piperacillin + Tazo.		R	≥128/4	
Cefotaxime + Sulb.		R		
Cefoperazone+Sulb.		R		
Ceftriaxone + Sulb.		R		
Cefepime + Tazo.	16	I		
Ceftazidime + Tazo.		R		
Ceftriaxone + Tazo.		R		

Antibiotic	Zone of Inhibition (mm)	Inter preta tion	MIC (µg/ml)	Choice group
Carbapenems & Monobactum:				
Imipenem	23	S	≤4	1B
Meropenem	23	S	≤4	1B
Ertapenem	23	S	≤4	1B
Doripenem				
Aminoglycosides				
Gentamicin		R	≥8	
Tobramycin		R	≥8	
Netilmicin		R	≥32	
Neomicin				
Amikacin		R	≥32	
Kanamycin		R	≥25	
Fluoroquinolones				
Ciprofloxacin		R	≥4	
Ofloxacin		R	≥8	
Levofloxacin		R	≥8	
Gemifloxacin		R		
Moxyfloxacin		R		
Prulifloxacin		R		
Sparfloxacin		R		
Pazufloxacin		R		
Nalidixic acid		R		
Miscelaneous				
Doxycycline		R	≥16	
Azithromycin		R	≥128/4	
Chloramphenicol	20	S	≤8	2
Polymyxin B	12	S		2
Cotrimoxazole		R	≥8/152	
Tigecycline	26	S		2
Colistin	12	S		2

S - Sensitive I - Intermediate R - Resistant

Group 1A. Primarily used in uncomplicated infection.
Group 1B. Primarily used in complicated and resistant infection.
Group 2. Can be used supplementary only in complicated and resistant infection.
Note: > Proper selection of antibiotic can only be done by the clinicians according to patient's clinical condition.



Patient's Name: B / O Vanitaben
Referred by: Sparsh Hospital
Sample: Blood
Age/Sex:
Date: 16-Sep-14
Ref. No. MH - 1482

Culture Examination::
Organism isolated: **Klebsiella pneumoniae**

Phenotype: **KPC (Klebsiella pneumoniae Carbapenemase) strain**

© Dr. Mansi U. Shah

Antibiotic Sensitivity:

Antibiotic	Zone of Inhibition (mm)	Inter preta tion	MIC (µg/ml)	Choice group
Penicillins				
Ampicillin		R	≥32	
Amoxycillin		R	≥32	
Piperacillin		R	≥128	
Cephalosporins				
Cephalexin		R		
Cefadroxil		R		
Cefaclor		R	≥32	
Cefuroxime axetile		R	≥32	
Cefazolin		R	≥32	
Cefpodoxime		R	≥8	
Cefprozil		R	≥32	
Cefotaxime		R	≥64	
Ceftriaxone		R	≥64	
Ceftizoxime		R	≥32	
Ceftazidime		R	≥32	
Cefixime		R	≥4	
Cefoperazone		R	≥64	
Cefpirome		R		
Cefepime		R	≥32	
Combinations				
Ampicillin+Sulb.		R	≥32/16	
Sultamicillin		R		
Amoxycillin+clav.		R	≥16/8	
Piperacillin + Tazo.		R	≥128/4	
Cefotaxime + Sulb.		R		
Cefoperazone+Sulb.		R		
Ceftriaxone + Sulb.		R		
Cefepime + Tazo.		R		
Ceftazidime + Tazo.		R		
Ceftriaxone + Tazo.		R		

Antibiotic	Zone of Inhibition (mm)	Inter preta tion	MIC (µg/ml)	Choice group
Carbapenems & Monobactum:				
Imipenem	16	R	≥8	
Meropenem	16	R	≥8	
Ertapenem	16	R	≥8	
Doripenem	12	R		
Aminoglycosides				
Gentamicin		R	≥8	
Tobramycin		R	≥8	
Netilmicin		R	≥32	
Neomicin				
Amikacin		R	≥32	
Kanamycin		R	≥25	
Fluoroquinolones				
Ciprofloxacin		R	≥4	
Ofloxacin		R	≥8	
Levofloxacin		R	≥8	
Gemifloxacin		R		
Moxyfloxacin		R		
Prulifloxacin		R		
Sparfloxacin		R		
Pazufloxacin		R		
Nalidixic acid		R		
Miscellaneous				
Doxycycline		R	≥16	
Azithromycin		R		
Chloramphenicol	26	S	≤8	2
Polymyxin B	12	S		2
Cotrimoxazole		R	≥8/152	
Tigecycline	26	S		2
Colistin	12	S		2

S - Sensitive I - Intermediate R - Resistant

Group 1A. Primarily used in uncomplicated infection.
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Group 2. Can be used supplementary only in complicated and resistant infection.
Note: > Proper selection of antibiotic can only be done by the clinicians according to patient's clinical condition.

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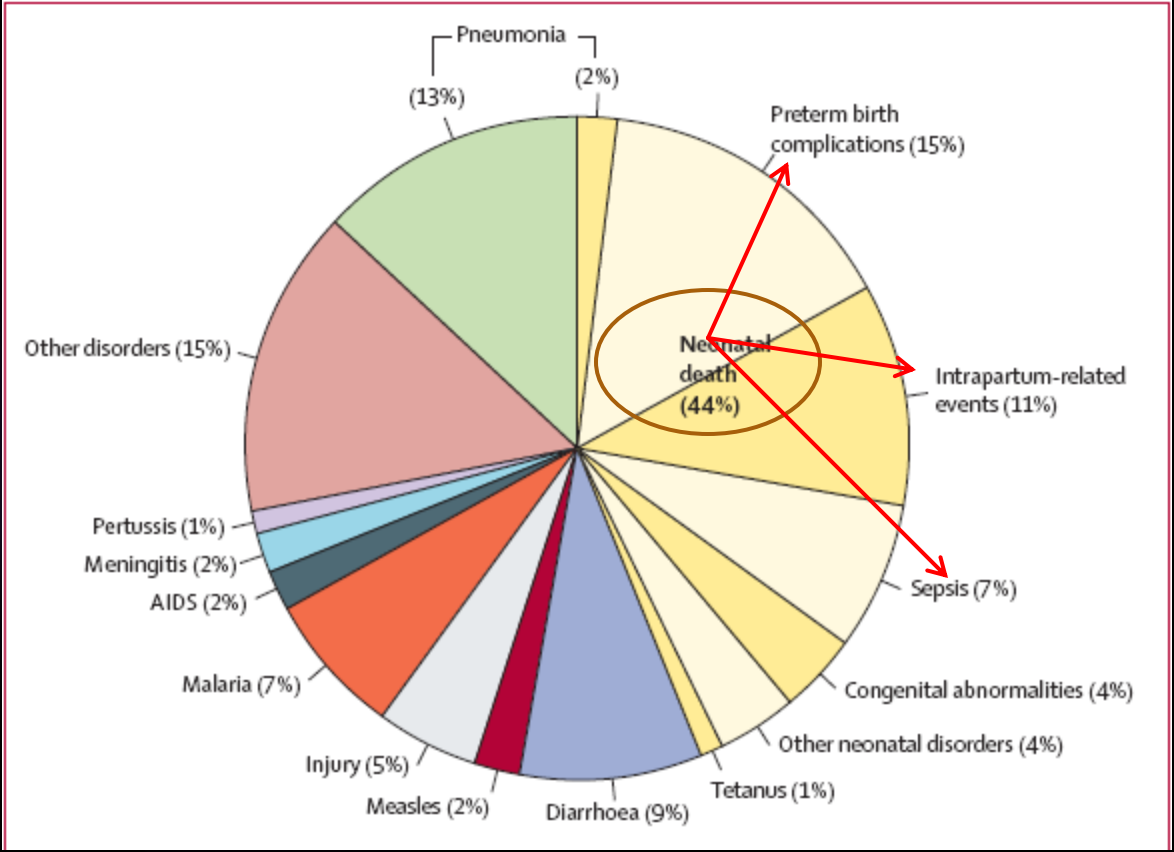
"I've had the struggle of living with a resistance to antibiotics for nearly eight years of my life...there is a clear need for new antibiotics."

"With every sting and every pain, my heart sinks at the thought of how many antibiotics I have
left to use this time.

Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis *Lancet* 2015; 385: 430–40



	Number of deaths (UR; millions)
Neonates aged 0–27 days	
Preterm birth complications	0·965 (0·615–1·537)
Intrapartum-related complications	0·662 (0·421–1·054)
Sepsis	0·421 (0·269–0·688)
Congenital abnormalities	0·276 (0·175–0·438)
Other disorders	0·232 (0·145–0·373)
Neonatal pneumonia*	0·136 (0·084–0·219)
Tetanus	0·049 (0·032–0·079)
Neonatal diarrhoea†	0·020 (0·012–0·033)
Children aged 1–59 months	
Other disorders	0·967 (0·781–1·134)
Pneumonia*	0·800 (0·681–0·923)
Diarrhoea†	0·558 (0·429–0·731)
Malaria	0·456 (0·351–0·546)
Injury	0·324 (0·258–0·391)
Meningitis	0·151 (0·125–0·185)
AIDS	0·103 (0·076–0·142)
Measles	0·102 (0·074–0·166)
Pertussis	0·060 (0·043–0·094)

UR=uncertainty range. *Estimated number of pneumonia deaths in children younger than 5 years overall including the neonatal period is 0·935 million (UR 0·817–1·057 million; 14·9%, UR 13·0–16·8). †Estimated number of diarrhoea deaths in children younger than 5 years overall including the neonatal period is 0·578 million (0·448–0·750 million; 9·2%, 7·1–11·9).

Table: **Estimated numbers of deaths by cause in 2013**

Indian J Pediatr. 2011 Apr;78(4):409-12. doi: 10.1007/s12098-010-0272-1. Epub 2010 Oct 17.

Aetiology and antimicrobial resistance of neonatal sepsis at a tertiary care centre in eastern India: a 3 year study.

Neonatal Sepsis: High Antibiotic Resistance of the Bacterial Pathogens in a Neonatal Intensive Care Unit of a Tertiary Care HospitalNosocomial Infections in Neonatal Intensive Care Units: Profile, Risk Factor Assessment and Antibiogram

Saritha Kamath, Shrikara Mallaya and Shalini Shenoy
Department of Microbiology, Kasturba Medical College, Mangalore, Karnata


BACTERIOLOGICAL ANALYSIS … NCE
PATTERN AMONG VARIOUS … LATES FROM
NEONATAL SEPTICEMIA A… ARE HOSPITAL
OF AHMEDABAD
Sanjay D Rathod[1], Palak V Bhatia[2], Parimal … [3], Lata R Patel[3], Bimal Chauhan[4]

Gram negative organism
Multiple drug resistance

Indian J Med Res. 2008 Jan;127(…

Occurrence of ES… p-C beta-lactamases & susceptibility to newer antimicrobi… agents in complicated UTI.

Taneja N[1], Rao P, Arora J, Dogra A.

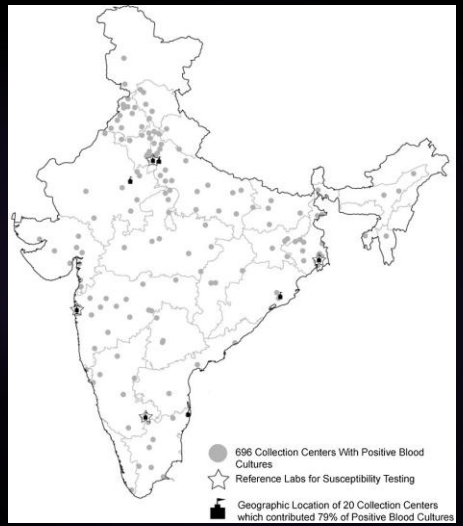
Indian J Pediatr. 2011 Apr;78(4):409-12. doi: 10.1007/s12098-010-0272-1. Epub 2010 Oct 17.

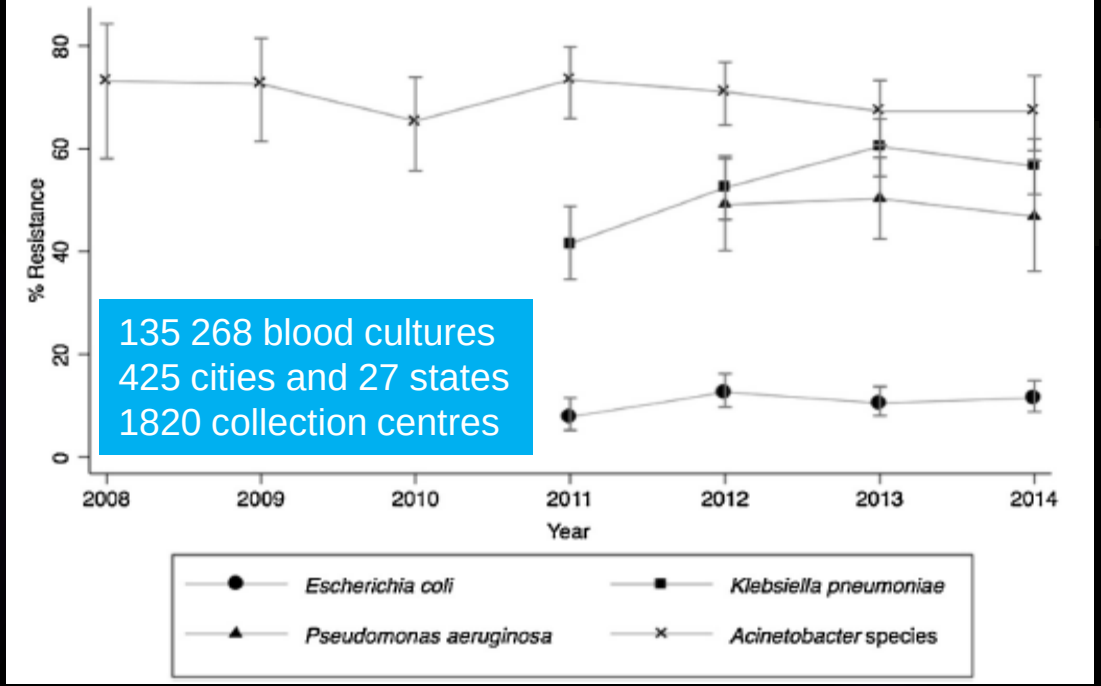
Aetiology and antimicrobial resistance of neonatal sepsis at a tertiary care centre in eastern India: a 3 year study.

Viswanathan R[1], Singh AK, Mukherjee S, Mukherjee R, Das P, Basu S

Trends in antibiotic resistance among major bacterial pathogens isolated from blood cultures tested at a large private laboratory network in India, 2008–2014☆

Sumanth Gandra[a], Nestor Mojica[a], Eili Y. Klein[b,c], Ashvin Ashok[b], Vidya Nerurkar[d], Mamta Kumari[d], Uma Ramesh[d], Sunanda Dey[d], Viral Vadwai[d], Bibhu R. Das[d], Ramanan Laxminarayan[a,e,f,*]

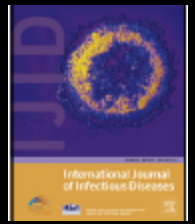




135 268 blood cultures
425 cities and 27 states
1820 collection centres

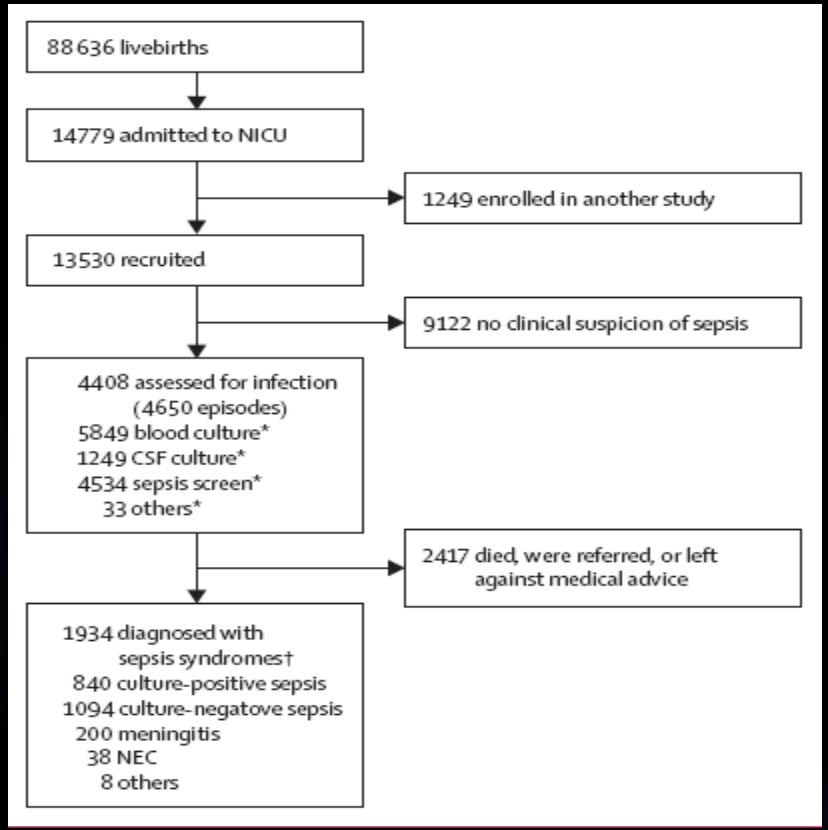
Carbapenem resistance trends among multiple organisms in India, 2008–2014

Conclusion: Increasing resistance to antibiotics of last-resort, particularly among Gram-negatives, suggests an urgent need for new antibiotics and improved antimicrobial stewardship programs in India.



Characterisation and antimicrobial resistance of sepsis pathogens in neonates born in tertiary care centres in Delhi, India: a cohort study

*Investigators of the Delhi Neonatal Infection Study (DeNIS) collaboration**



	Total sepsis	Culture-positive sepsis	Culture-negative sepsis	Meningitis
Incidence*				
Overall (n=13 530)	1934 (14·3%; 13·8–14·9)	840 (6·2%; 5·8–6·6)	1094 (8·1%; 7·6–8·6)	200 (1·5%; 1·3–1·7)
Site 1 (n=9239)	1237 (13·4%; 12·7–14·1)	502 (5·4%; 5·0–5·9)	735 (8·0%; 7·4–8·5)	119 (1·3%; 1·1–1·5)
Site 2 (n=2657)	502 (18·9%; 17·4–20·4)	279 (10·5%; 9·4–11·7)	223 (8·4%; 7·4–9·5)	67 (2·5%; 1·9–3·2)
Site 3 (n=1634)	195 (11·9%; 10·4–13·6)	59 (3·6%; 2·7–4·6)	136 (8·3%; 7·0–9·8)	14 (0·9% 0·5–1·4)
Incidence density†				
Overall (n=80 427)	1980 (24·6; 23·6–25·7)	847 (10·5; 9·8–11·3)	1133 (14·1; 13·3–14·9)	200 (2·5; 2·2–2·8)
Site 1 (n=42 419)	1246 (29·4; 27·8–31·0)	502 (11·8; 10·8–12·9)	744 (17·5; 16·3–18·8)	119 (2·8; 2·3–3·3)
Site 2 (n=21 342)	517 (24·2; 22·2–26·4)	281 (13·2; 11·7–14·8)	236 (11·1; 9·7–12·5)	64 (3·0; 2·3–3·8)
Site 3 (n=16 666)	217 (13·0; 11·3–14·8)	64 (3·8; 2·9–4·9)	153 (9·2; 7·8–10·7)	14 (0·8; 0·4–1·4)
Case fatality rate‡				
Overall	496/1934 (25·6%; 23·7–27·7)	400/840 (47·6%; 44·2–51·0)	96/1094 (8·8%; 7·2–10·6)	102/200 (51·0%; 43·8–58·1)
Site 1	248/1237 (20·0%; 17·8–22·4)	200/502 (39·8%; 35·5–44·3)	48/735 (6·5%; 4·8–8·6)	45/119 (37·8%; 29·1–47·2)
Site 2	226/502 (45·0%; 40·6–49·5)	188/279 (67·4%; 61·5–72·8)	38/223 (17·0%; 12·3–22·6)	56/67 (83·6%; 72·5–91·5)
Site 3	22/195 (11·3%; 7·2–16·6)	12/59 (20·3%; 11·0–32·8)	10/136 (10·4%; 3·6–13·1)	1/14 (7·1%; 0·2–33·8)

*Among those admitted to neonatal intensive care. Data are number of cases (%; 95% CI). †Data are number of episodes, (number of episodes per 1000 patient-days; 95% CI). ‡Data are number of deaths/number of cases (%; 95% CI).

Table 2: Incidence and case fatality of neonatal sepsis

	Number of isolates (n=1005)	Number of deaths (case fatality rate)
Gram negative		
Acinetobacter spp	222 (22%)	130 (59%)
Klebsiella spp	169 (17%)	95 (56%)
Escherichia coli	137 (14%)	83 (61%)
Pseudomonas spp	68 (7%)	53 (78%)
Enterobacter spp	44 (4%)	16 (36%)
Gram positive		
Coagulase-negative staphylococci	150 (15%)	40 (27%)
Staphylococcus aureus	122 (12%)	43 (35%)
Enterococcus spp	56 (6%)	33 (59%)
Group B streptococci	8 (1%)	5 (62%)
Others	29 (3%)	13 (45%)

Data are n (%). See appendix for further details on meningitis and central line associated bloodstream infection.

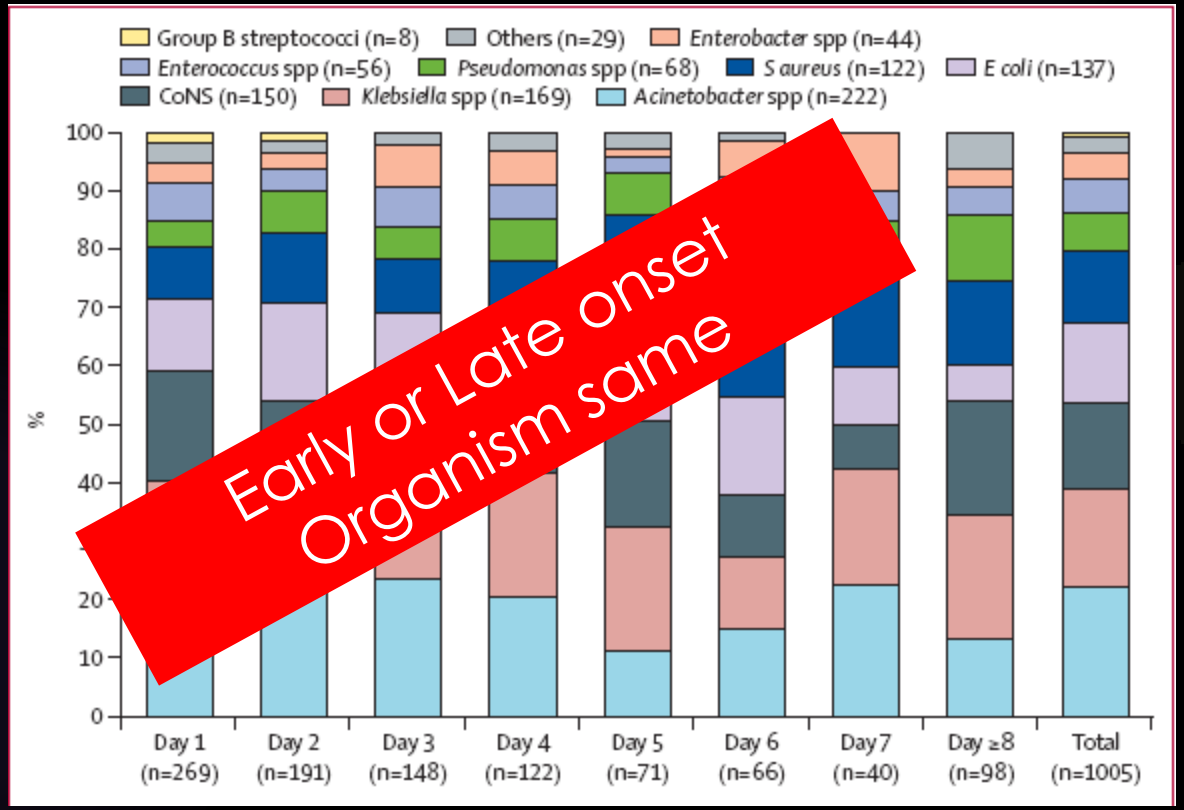
Table 3: Profile of bacterial isolates and their case fatality rates

Organism name	Overall (n=1005)	Site 1 (n=576)	Site 2 (n=359)	Site 3 (n=70)
Acinetobacter spp.	222 (22·1%)	155 (26·9%)	62 (17·3%)	5 (7·1%)
Klebsiella spp.	169 (16·8%)	67 (11·6%)	89 (24·8%)	13 (18·6%)
CoNS	150 (14·9%)	90 (15·6%)	28 (7·8%)	32 (45·7%)
E. coli	137 (13·6%)	64 (11·1%)	69 (19·2%)	4 (5·7%)
Staphylococcus aureus	122 (12·1%)	88 (15·3%)	29 (8·1%)	5 (7·1%)
Pseudomonas spp.	68 (6·8%)	10 (1·7%)	50 (13·9%)	8 (11·4%)
Enterococcus spp.	56 (5·6%)	33 (5·7%)	22 (6·1%)	1 (1·4%)
Enterobacter spp.	44 (4·4%)	41 (7·1%)	2 (0·6%)	1 (1·4%)
Streptococcus spp.	12 (1·2%)	10 (1·7%)	2 (0·6%)	0
GBS	8 (0·8%)	8 (1·4%)	0	0
Candida spp.	7 (0·7%)	4 (0·7%)	2 (0·6%)	1 (1·4%)
Others	10 (1·0%)	6 (1·0)	4 (1·1%)	0

NB: For multiple isolates detected from a single episode, we used the following rules:

- If single culture was sent and it grew two organisms, both organisms were included.
- If multiple cultures were sent, and same organism was isolated in all, only the first organism was included.
- If multiple cultures were sent, and different were organisms isolated, all organisms were included.

Webtable 11: **Pathogen profile by site**


Group B streptococci (n=8)
Others (n=29)
Enterobacter spp (n=44)
Enterococcus spp (n=56)
Pseudomonas spp (n=68)
S aureus (n=122)
E coli (n=137)
CoNS (n=150)
Klebsiella spp (n=169)
Acinetobacter spp (n=222)
%
100
90
80
70
60
50
40
20
10
0
Day 1 (n=269)
Day 2 (n=191)
Day 3 (n=148)
Day 4 (n=122)
Day 5 (n=71)
Day 6 (n=66)
Day 7 (n=40)
Day ≥8 (n=98)
Total (n=1005)
Early or Late onset
Organism same

	Number of resistant isolates	CFR in culture-positive sepsis due to resistant pathogens	CFR in culture-positive sepsis due to sensitive pathogens
Gram positive			
Coagulase-negative staphylococci (n=150)			
Meticillin	85/140 (61%)	23/85 (27%)	14/55 (25%)
Vancomycin	0/138	..	36/138 (26%)
Staphylococcus aureus (n=122)			
Meticillin	43/114 (38%)	16/43(37%)	22/71 (31%)
Vancomycin	0/114	..	38/114 (33%)
Enterococcus spp (n=56)			
Meticillin	11/14 (79%)	10/11 (91%)	2/3 (67%)
Vancomycin	13/48 (27%)	9/13 (69%)	20/35 (57%)

Data are n/N (%); there are variations in denominators in few cells as antibiotic sensitivity testing for all drugs was not done. CFR=case fatality rate. ES=ex… spectrum. MDR=multidrug resistance (ie, I [intermediate] or R [resistan… drug in three of the following classes: ES cephalosporins, fluoroquinolon… aminoglycosides, carbapenems, and piperacillin-tazobactam).

- Acenatobacter most common org.
- HIGH degree of resistance to Reserve antibiotics
- Almost 50% C/S positive died
- 25% of all death were bcs of sepsis
- Mortality almost same between sensitive and resistance pathogens!!!

Nearly quarter of Acinetobacter and three quarter of Klebsiella showed NDM-1 in pool of carb. Resistance strain

- Early occurrence of Sepsis (most episodes occurred with in 72 hrs)
- Quarter of culture positive episodes occurred with in 24 hrs of birth
- two third with in 72 hrs
- CFR did not differ between Early or late onset

Antibiotic resistance—the need for global solutions

Ramanan Laxminarayan, PhD, Adriano Duse, MD, Chand Wattal, MD, Anita K M Zaidi, MD, Heiman F L Wertheim, MD, Nithima Sumpradit, PhD, Erika Vlieghe, MD, Prof Gabriel Levy Hara, MD, Ian M Gould, MBChB, Herman Goossens, PhD, Christina Greko, PhD, Prof Anthony D So, MD, Maryam Bigdeli, MPH, Prof Göran Tomson, MD, Will Woodhouse, Eva Ombaka, PhD, Prof Arturo Quizhpe Peralta, MD, Farah Naz Qamar, MBBS, Fatima Mir, PhD, Sam Kariuki, PhD, Prof Zulfiqar A Bhutta, PhD, Prof Anthony Coates, MD, Richard Bergstrom, MSc, Gerard D Wright, PhD, Eric D Brown, PhD, Prof Otto Cars, MD

The Lancet Infectious Diseases
Volume 13, Issue 12, Pages 1057-1098 (December 2013)
DOI: 10.1016/S1473-3099(13)70318-9

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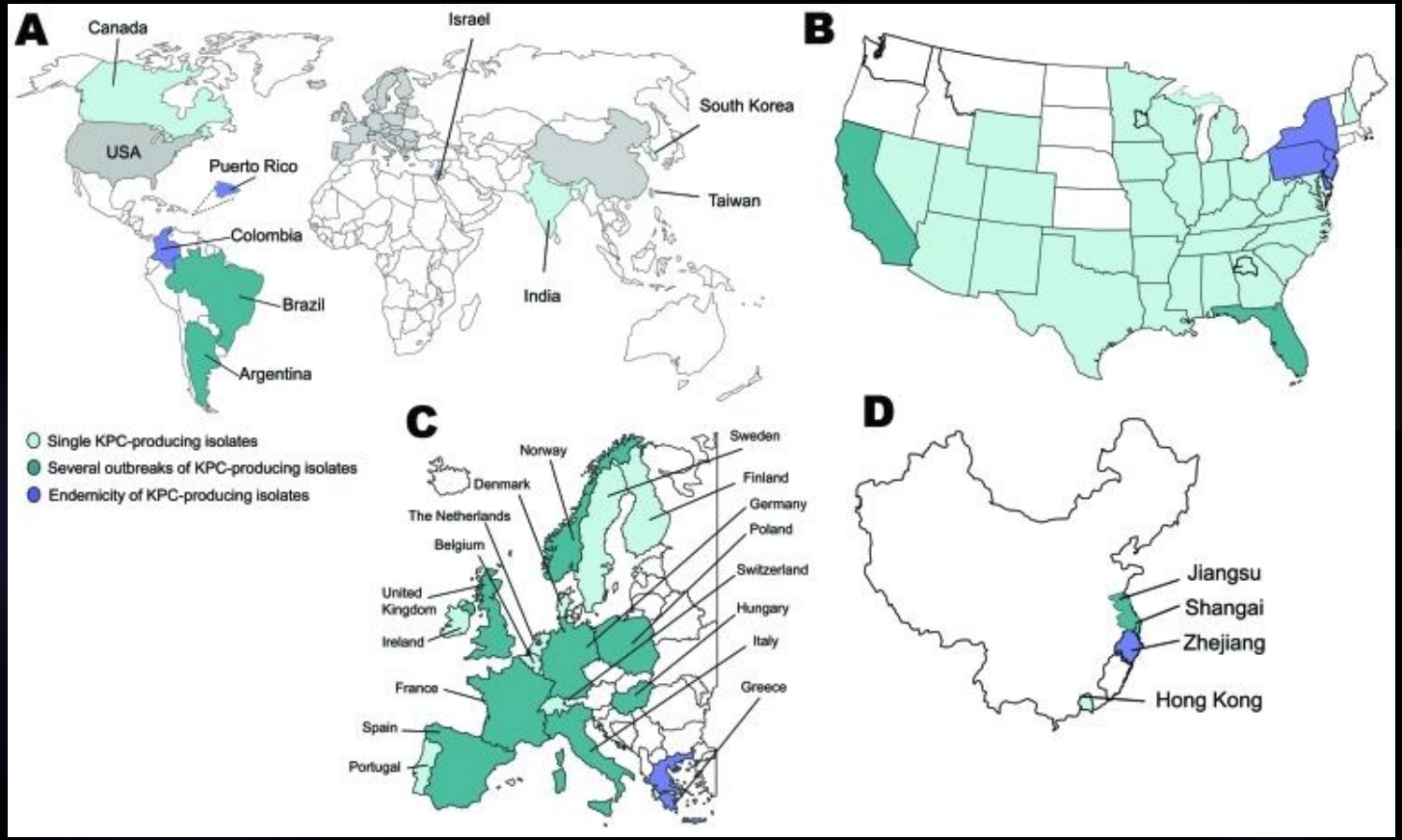
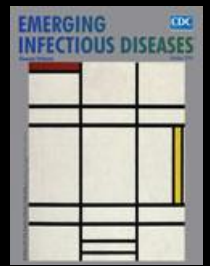
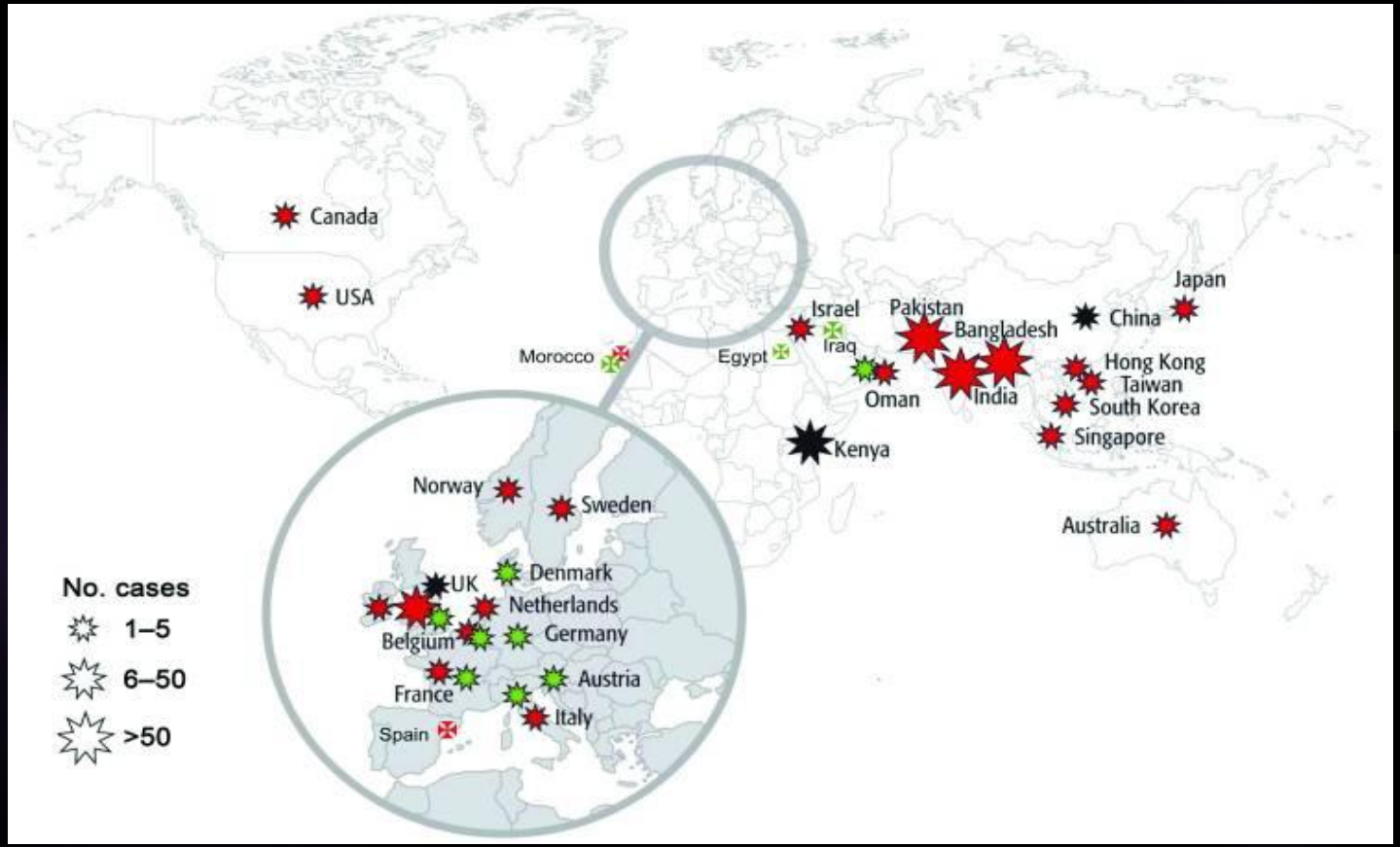
Worldwide geographic distribution of*Klebsiella pneumoniae*carbapenemase (KPC)





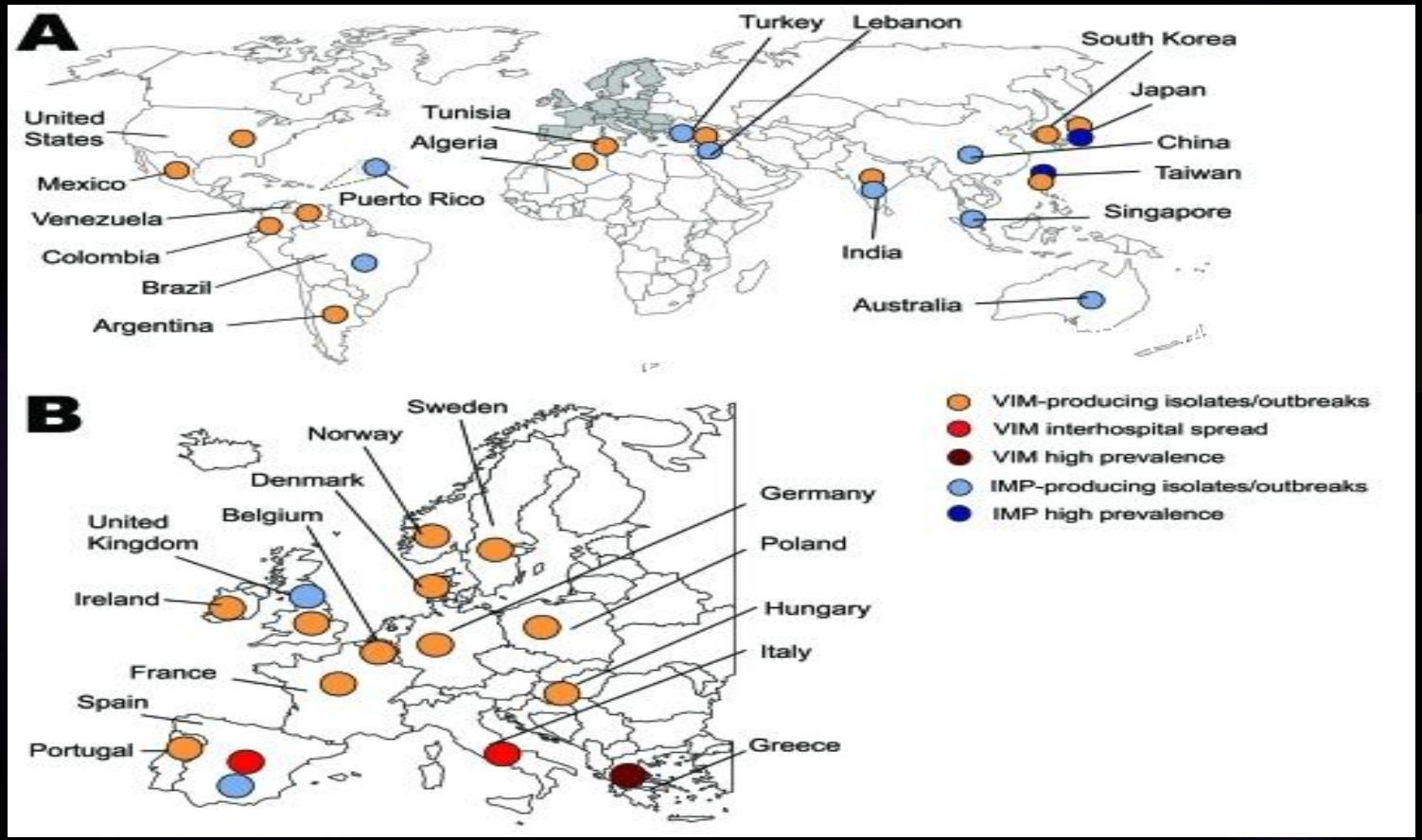
Volume 17, Number 10—October 2011

Geographic distribution of New Delhi metallo-β-lactamase-1 producers,

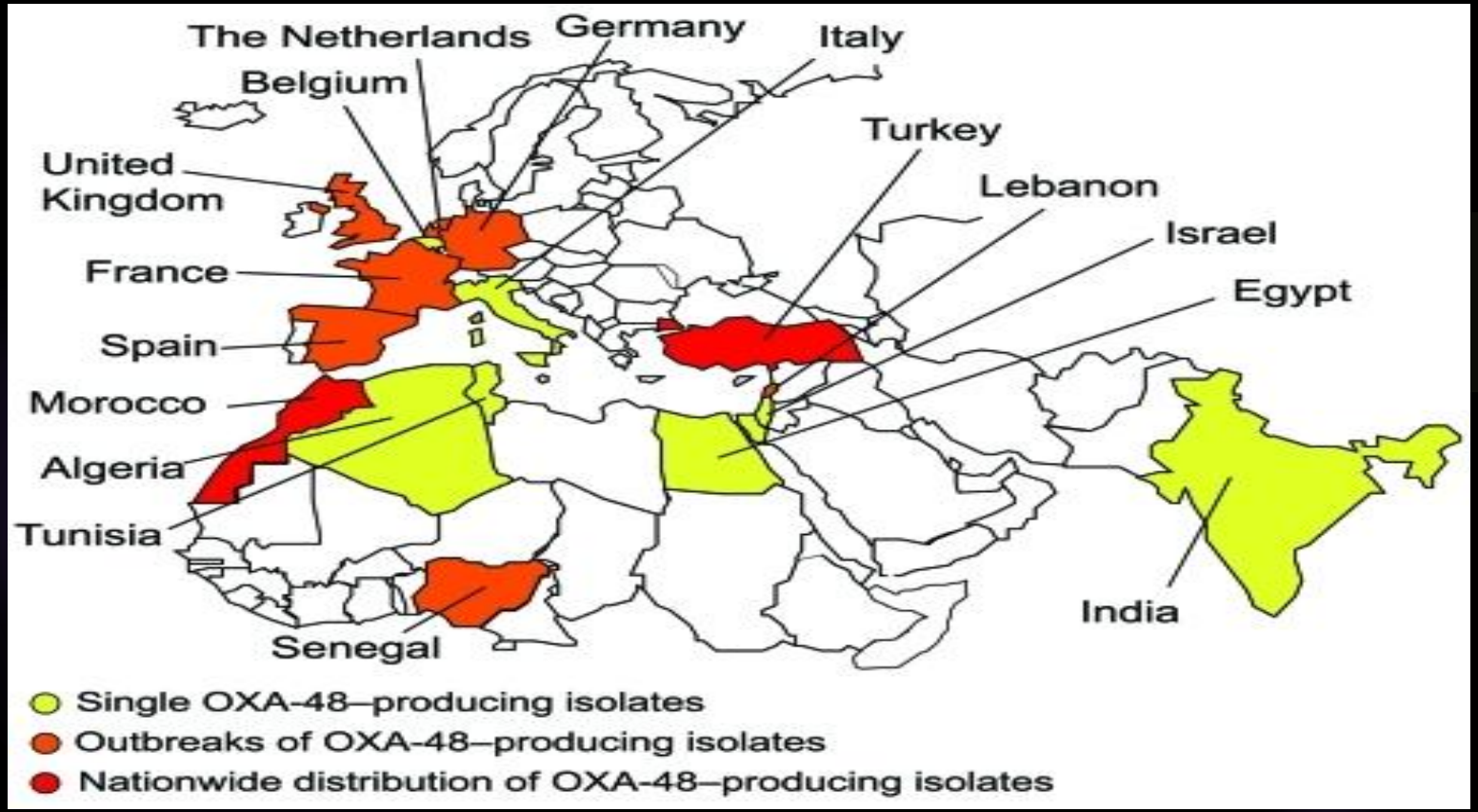


Volume 17, Number 10—October 2011

Verona integron–encoded metallo-β-lactamase (VIM) and IMP enterobacterial producers



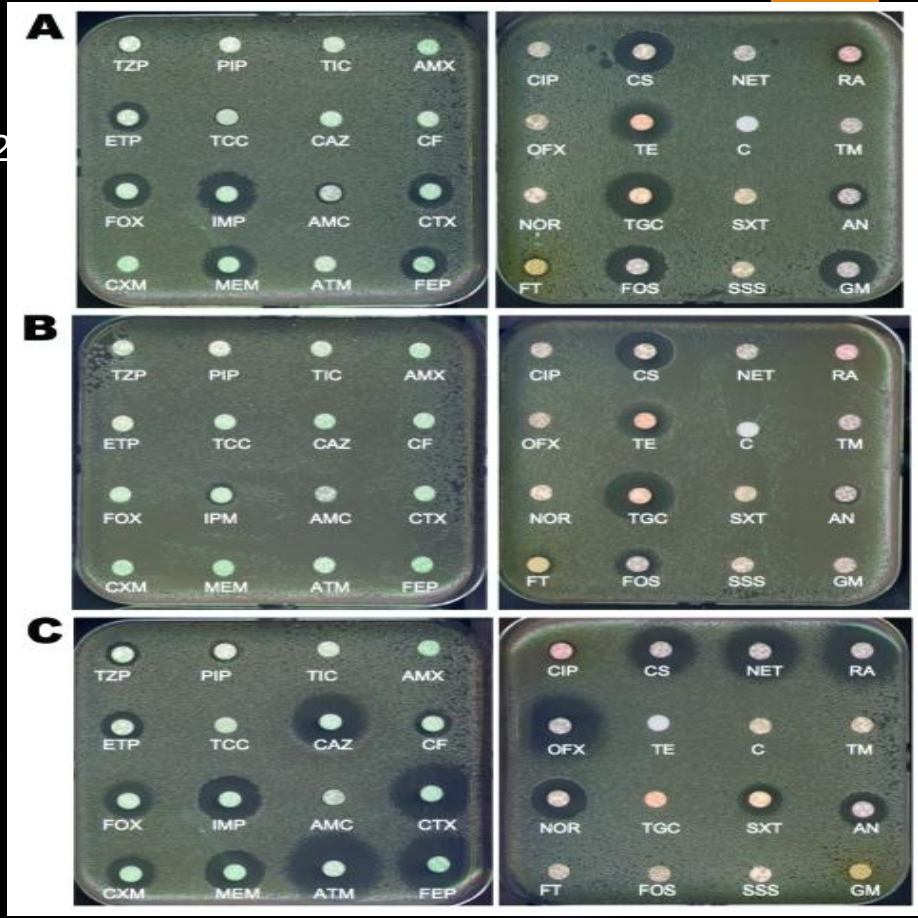
oxacillinase-48 (OXA-48) type producers



Klebsiella pneumoniae carbapenemase-2 (KPC-2

New Delhi metallo-β-lactamase-1 (NDM-1)

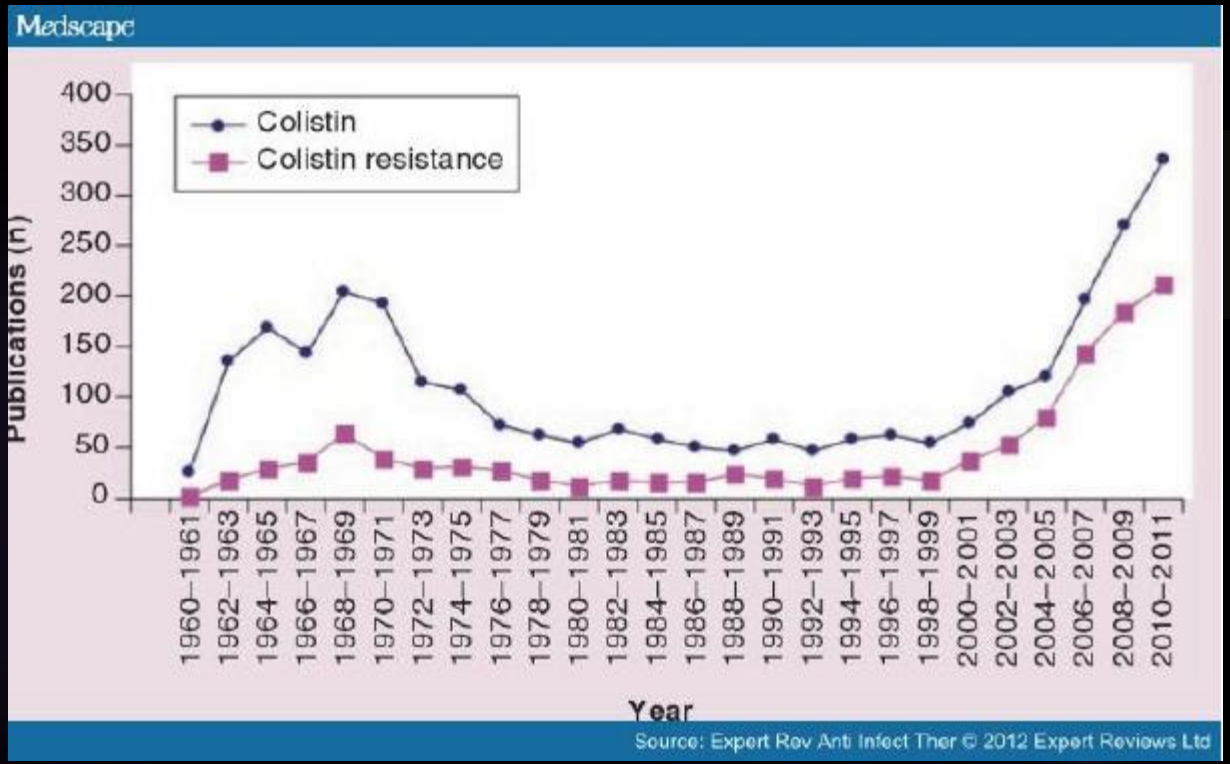
oxacillinase-48 (OXA-48)–producing*K. Pneumoniae*



Colistin: An Update on the Antibiotic of the 21st Century

Silpak Biswas; Jean-Michel Brunel; Jean-Christophe Dubus; Martine Reynaud-Gaubert; Jean-Marc Rolain

Expert Rev Anti Infect Ther. 2012;10(8):917-934.



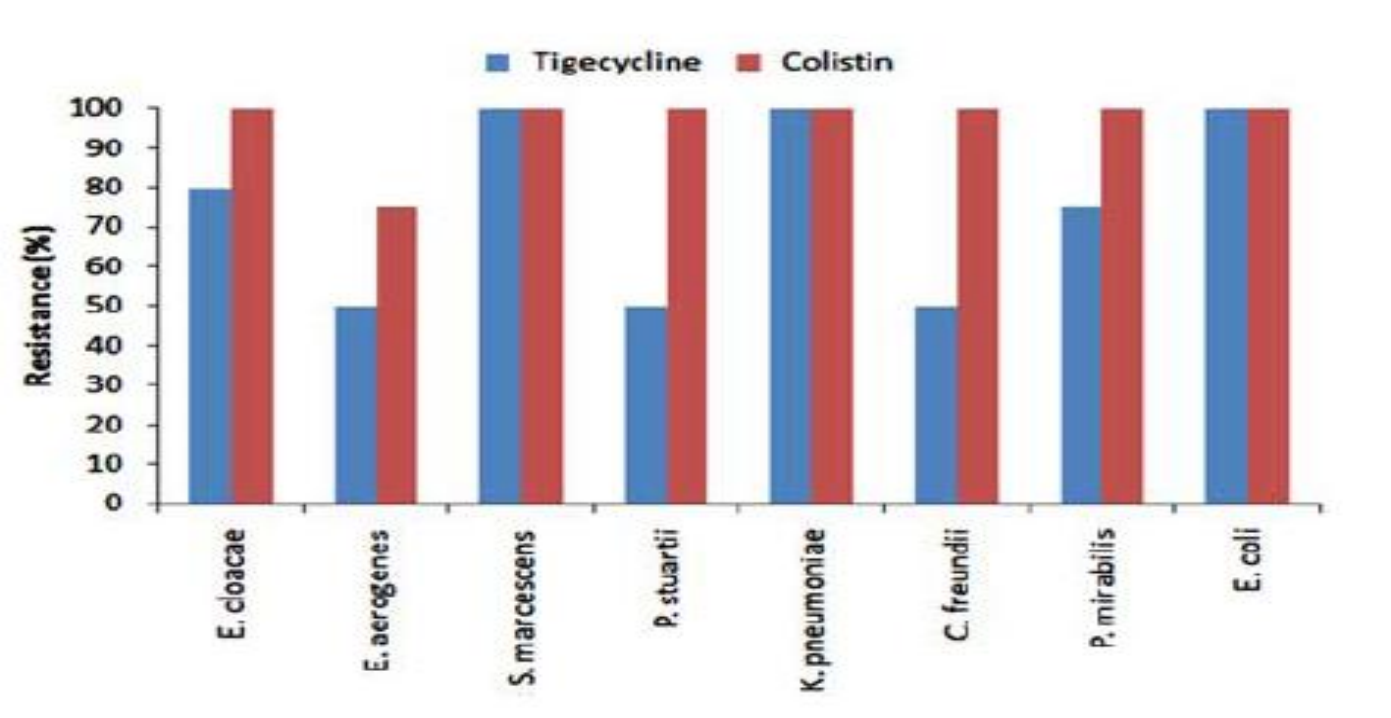
Mechanism of polymyxin resistance	Bacteria	Ref.
LPS alteration	*Escherichia coli*, *Salmonella*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*	[86,91,94–96,98,104,105,120,213]
Mutations in the *pmr*A and *pmr*B genes and two-component signaling proteins	*A. baumannii*	[86,104,105,120]
Mutations in *lpxA*, *lpxC* and *lpxD* induces loss of the lipid A component of lipopolysaccharide	*A. baumannii*	[102,103]
Role of OprH, an outer membrane protein altered	*P. aeruginosa*	[106,111,214]
Changes in negatively charged surface LPS induced by the regulatory loci *pmrA* and *phoP*	*Enterobacteriaceae*	[54]
Resistance by mutation in *pmrA* and *PmrB* genes	*Salmonella*	[119,215]

Study (year)	Organism (n)	Polymyxin studied	Method	Drug combined	Synergy	Ref.
Liang *et al.* (2011)	*Acinetobacter baumannii* (14)	Colistin	Time-kill study	Meropenem Minocycline Rifampicin	100 100 100	[168]
Sheng *et al.* (2011)	*Acinetobacter* spp. (17)	Colistin	Time-kill study Checkerboard	Imipenem Imipenem	75–100 42–100	[171]
Wareham *et al.* (2011)	*A. baumannii* (6)	Colistin	Time-kill study Checkerboard	Teichoplanin Teichoplanin	100 100	[178]
Souli *et al.* (2011)	*Klebsiella pneumonia* (17)	Colistin	Time-kill study	Fosfomycin	11.8	[216]
Gordon *et al.* (2010)	*A. baumannii* (39)	Colistin	Etest	Vancomycin	100	[156]
Elemam *et al.* (2010)	*K. pneumonia* (12)	PMB	Checkerboard	Rifampicin Doxycycline Tigecycline	100 100 100	[162]
Pankey *et al.* (2009)	*A. baumannii* (8)	PMB	Time-kill study Etest	Meropenem Meropenem	100 63	[217]
Principe *et al.* (2009)	*A. baumannii* (22)	Colistin	Checkerboard	Tigecycline	8.3	[218]
López *et al.* (2008)	*Pseudomonas aeruginosa* (12)	Colistin	Checkerboard	Doxycycline Rifampicin Azithromycin	66.6 16.6 25	[219]
Tan *et al.* (2007)	*A. baumannii* (13)	Colistin	Time-kill study	Minocycline	92	[220]
Li *et al.* (2007)	*A. baumannii* (8)	Colistin	Checkerboard	Rifampicin	100	[169]
Timurkaynak *et al.* (2006)	*P. aeruginosa* (5)	Colistin	Checkerboard	Rifampicin Meropenem Azithromycin	40 0 0	[221]

Colistin and Tigecycline Resistance in Carbapenem-Resistant Enterobacteriaceae: Checkmate to Our Last Line Of Defense

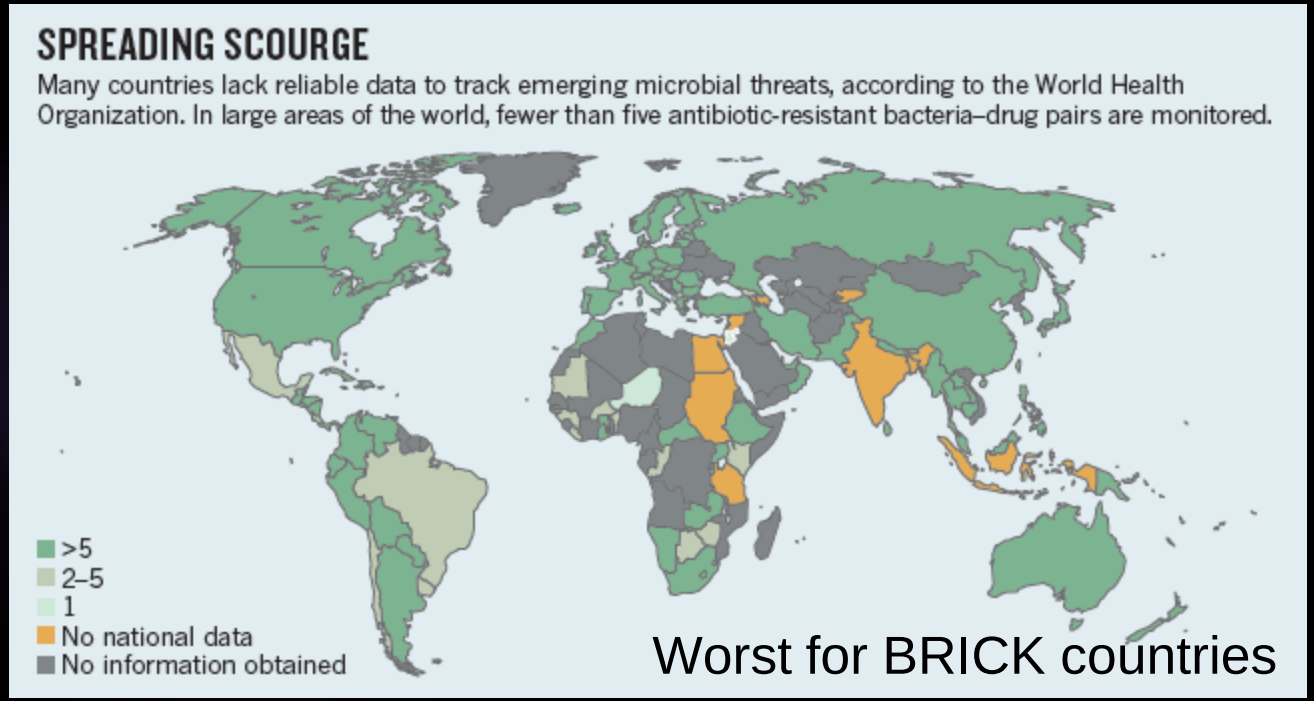
Mohit Kumar

Infection Control & Hospital Epidemiology / *FirstView* Article / April 2016, pp 1 - 2



Antibiotic resistance sweeping developing world

Bacteria are increasingly dodging extermination as drug availability outpaces regulation.



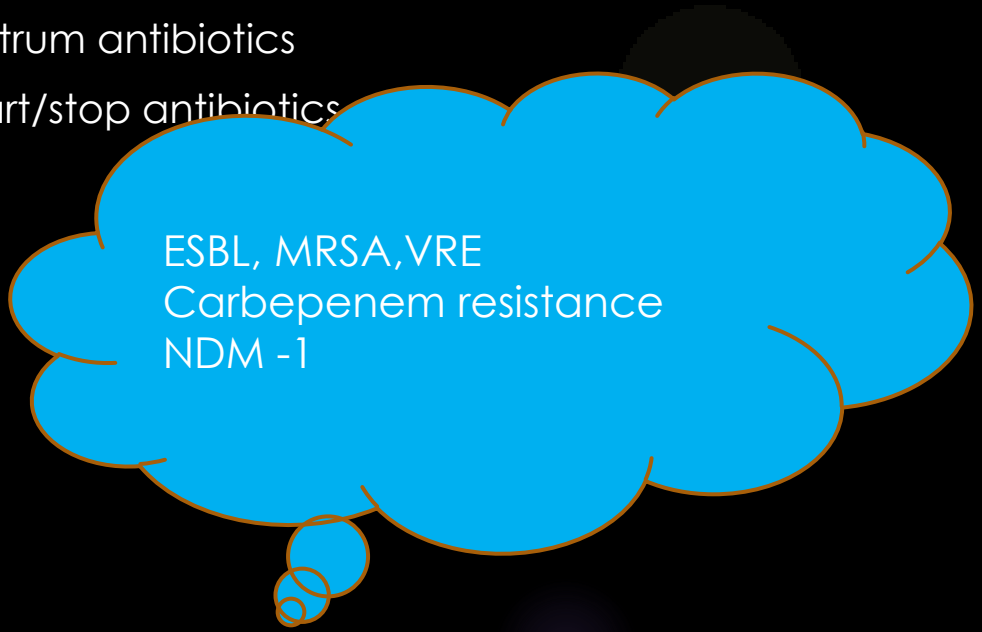
Worst for BRICK countries

Antibiotic Resistance in India: Drivers and Opportunities for Action

Ramanan Laxminarayan[1,2,3]*, Ranjit Roy Chaudhury[4†]

ACCESS

- Prolonged course of antibiotics
- Undisciplined use of broad spectrum antibiotics
- Overdependence on CRP to start/stop antibiotics
- Absence of culture facilities



Antibiotic Resistance in India: Drivers and Opportunities for Action

Ramanan Laxminarayan[1,2,3]*, Ranjit Roy Chaudhury[4†]

50 samples from street taps — sources of drinking, washing and cooking water for entire neighborhoods — and 171 samples of “seepage” (surface water and street puddles) from around New Delhi. NDM-1 in two of the drinking-water samples (4 percent) and 51 of the 171 seepage samples (30 percent).

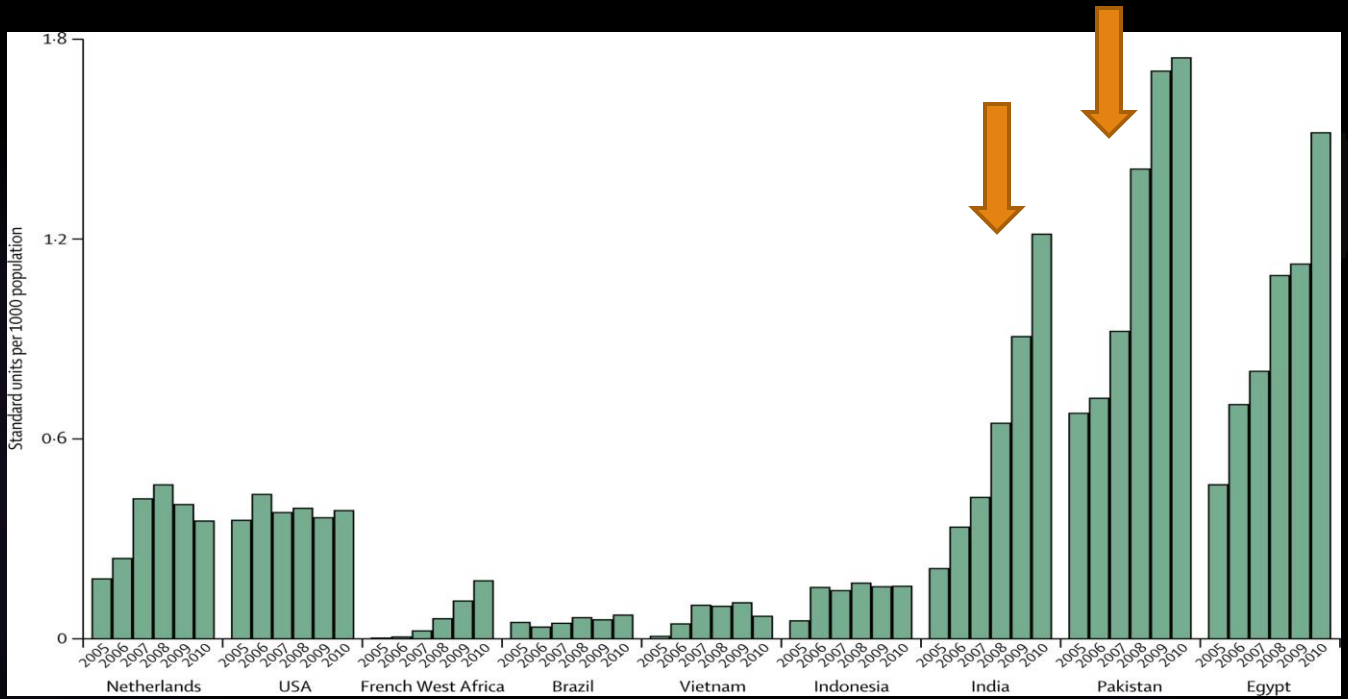
Poor public health infrastructure, Rising income, high burden of disease, unregulated sale of antibiotics

It is doable….

स्वच्छ भारत

एक कदम स्वच्छता की ओर

Trends in retail sales of carbapenem antibiotics for Gram-negative bacteria



The Lancet Infectious Diseases 2013 13, 1057-1098DOI: (10.1016/S1473-3099(13)70318-9)

Antibiotic Therapy in Neonates: No prophylactic antibiotics

- Prophylactic antibiotics tried in
  - Prematurity
  - MSAF
  - All ventilated babies
  - Chest drains/ exchange etc.

Does not prevent Sepsis *

- Prophylaxis –
  - Increases risk of infection with Multi drug resistant pathogen
  - Predispose to antibiotic resistance

Antibiotic Therapy in Neonates: Treat infection and not colonisation

- Bacteria isolated from ET tube, catheters, long lines constitute colonization
- Do not use antibiotics for colonization
  - It is likely to increase antibiotic resistance and
  - It does not prevent systemic infection
- Growth of bacterium from normally sterile body sites such as blood, CSF, ascitic tap, pleural tap etc. suggests infection

Role of Infection Control

- Strict hand washing.- Before examining first baby a thorough hand wash with detergent soap for at least 2 min and in-between babies hand wash for 30 sec.
- Strict asepsis during any procedure.
- Periodic review of antibiotic policy in the light of culture positive reports in the previous month.
- Rotation of antibiotics
- Periodic fumigation.

NICU policies…

- Not to admit diarrhoea patients and patients with open infected wounds in nicu.
- Isolation of culture positive septic babies.
- Restriction of visitors.
- Kangaroo mother care

Ten Point Action Plan on Antibiotic Use

- Always take blood cultures prior to start of antibiotics
- Use the narrowest spectrum antibiotics possible, almost always a penicillin and an aminoglycoside (e.g. Amikacin)
- Do not start treatment, as a general rule, with a 3rd generation cephalosporin (e.g. cefotaxime, ceftazidime) or a carbapenem (e.g. imipenem, meropenem).

Ten Point Action Plan on Antibiotic Use

- Develop local antibiotic policies to restrict the use of expensive, broad-spectrum antibiotics like imipenem for emergency treatment.
- Trust the microbiology laboratory. Rely on the blood culture results.
- Stop believing that a raised CRP means the baby is definitely septic.
- If blood cultures are negative at 2-3 days, it is almost always safe to stop antibiotics.

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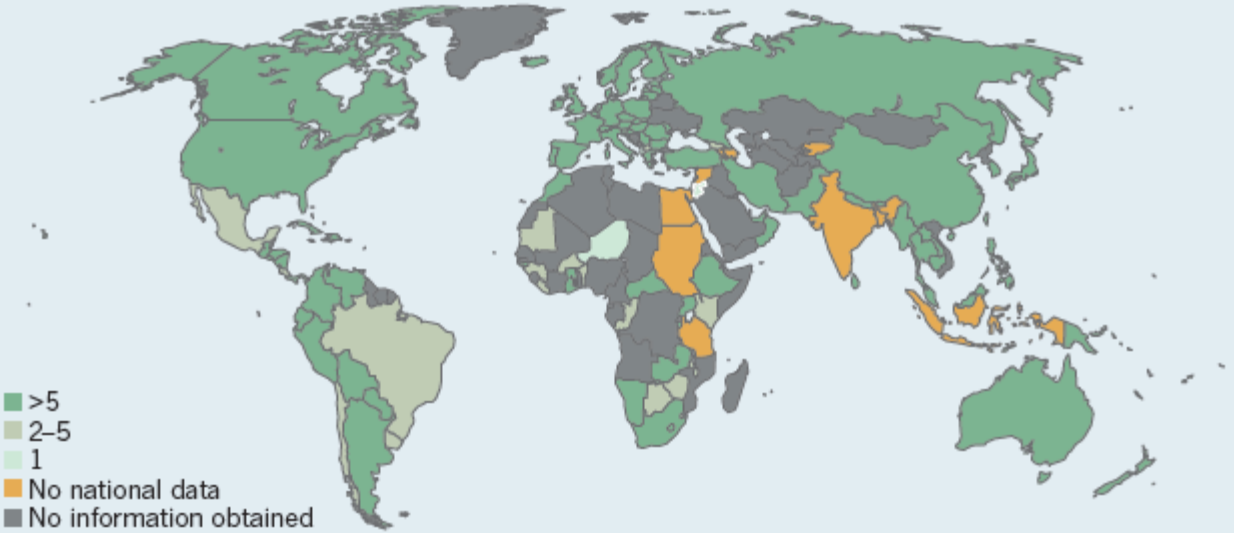
FOR I.V. USE
Advent
Injection
600mg
Cefotaxime Sodium
Injection IP
TAXIM
MIKACIN
Rx
Teicoplanin 200mg
TARGOCID
200mg
I.M./I.V.
For intramuscular or intravenous
1 Vial
Pfizer
Rx
Sulbactam &
Cefoperazone
for Injection
MAGNEX*
1g
*For IV or IM use only
Cipla
acivir iv
I.V. USE ONLY
Rx
AMPICILLIN AND
SULBACTAM
FOR INJECTION USP
SULBACIN®
IM
IV
INJECTION 1.5 g
UNICHEM
Rx
Piperacillin and
Tazobactam for Injection USP
PIPZO®
1.125 g
पिप्ज़ो
Fosfomycin Sodium
for Injection 4 gm
crifos 4
I.V. USE ONLY
Doxycycline for
Injection USP
DOXIFIC
डॉक्सिफिक
100 mg per vial
STERILE
FOR IV INFUSION ONLY
Lyophilised
Cipla
CritiCare
TRY YOUR LUCK !!!!!!
Cipla
Meropene
Injection IP 125 m
merocrit baby
I.V. USE ONLY
Rx
Ceftazidime
jection IP
tum®
for Injection
enous or
lar use
Cipla
Colistimethate Sodium for
Injection IP 1 Million IU
Powder for Solution for Injection,
Infusion or Inhalation
xylistin
1 MIU
For intravenous/inhalation use only
1 vial
Rx
VANCOMYCIN
HYDROCHLORIDE
FOR INTRAVENOUS
INFUSION IP
Vancocin® CP
500 mg
Chromatographically Purified
Vancomycin Hydrochloride.
500,000 IU per Vial.
1,000 IU per mg
of Vancomycin.
For I.V. use only
AstraZeneca
AMPHOTRET
Cipla
Rx
Sulbactam & Cefoperazone
for Injection 1g
Zostum
Zuvem
Tigecycline
for Injection
Tygacil
Sterile Lyophilized Powder
for Intravenous Infusion
1 vial per carton
50 mg
Tigecycline
per vial
Cipla
Minocycline For
Injection USP 100 mg
Divaine
I.V. USE ONLY

Conclusions

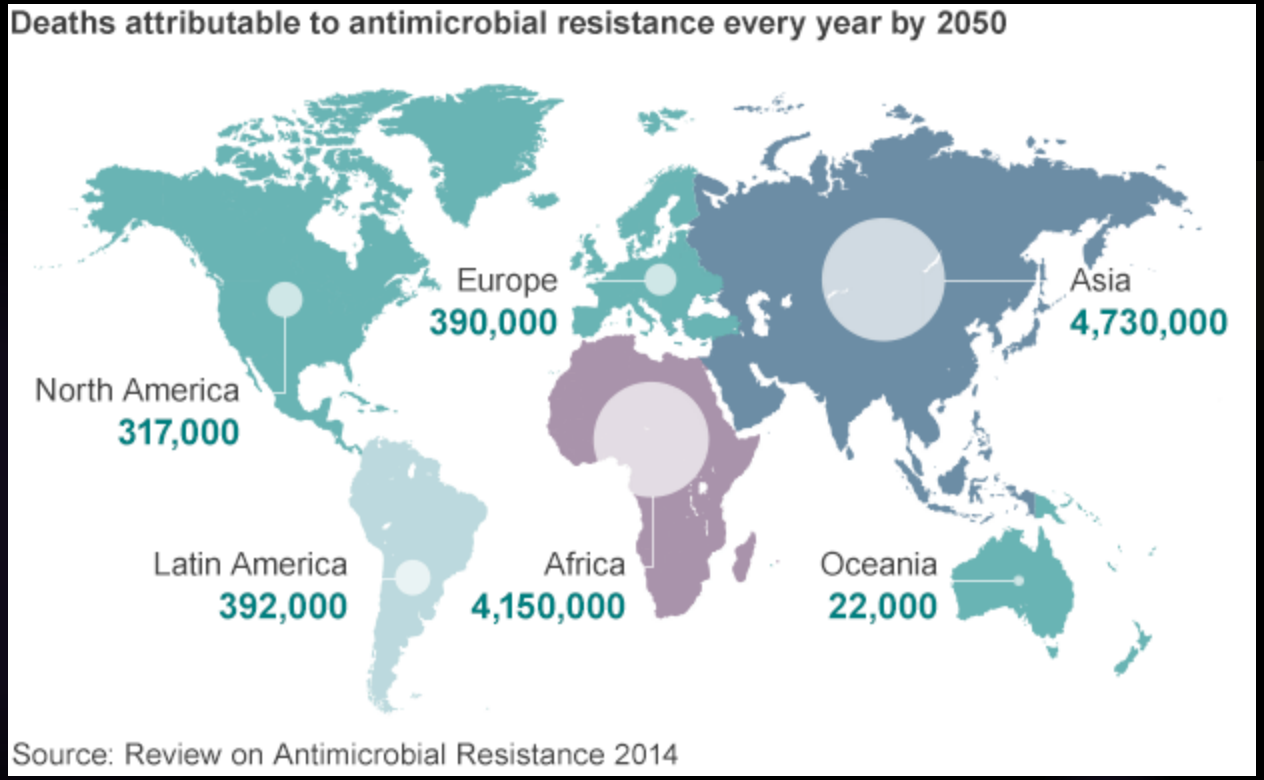
- Can't predict which antibiotics will work and which will not in current scenario of MDRS organism.
- Go by org pattern and C/S sensitivity of your set up
- Prevention of sepsis has to be a priority and on war foot basis.
- Ten rule of antibiotics usage is MUST to be observed.
- **it's a Question of our own image as a community/country**.

SPREADING SCOURGE

Many countries lack reliable data to track emerging microbial threats, according to the World Health Organization. In large areas of the world, fewer than five antibiotic-resistant bacteria–drug pairs are monitored.



Lord Jim O'Neill, who led the Review on Antimicrobial Resistance, said a campaign was needed to stop people treating antibiotics like sweets.



Area addressed	Principles	Strategies in highly regulated, structured healthcare setting	Strategies in poorly regulated, minimally structured healthcare setting	Examples of key professionals involved in implementation of context-specific strategies
Timely antibiotic management Who? When?	- Prompt initiation of AM therapy if bacterial infection suspected - Avoid using AMs when not indicated (ie. URTI) - Inclusion of guidance on clinical syndromes that do and do not require AM therapy in clinical	Use care bundles supported by electronic prescribing and automated algorithms Use strategies such as delayed prescribing for patients unlikely to benefit from immediate antibiotic	Develop regulatory approaches to deal with counterfeit or poor quality antibiotics Train community pharmacists and community and hospital health workers on rational	- First contact AM prescribers (community and hospital) - Pharmacists (community and hospital) - Regulators - Public health practitioners and organizations

ACCEPTED

Antimicrobial Stewardship for neonates and children: A Global Approach

Julia Bielicki[1], Rebecca Lundin[2], Sanjay Patel[3], Stéphane Paulus[4,5]

Appropriate selection of antibiotics What?	- Selection of appropriate AM regimens - Selection of AMs on basis of local antibiograms and guidelines with preference given to antibiotics less likely to promote the emergence of resistance	Develop and use rapid microbiological diagnostics and biomarkers Regular automated review of local microbiology resistance data to update empiric AB prescribing guidelines	Specify responsibility for and mechanisms to ensure guidelines are available, relevant to context and up to date Establish surveillance activities to collect regional or local microbiological data	- First contact AM prescribers (community and hospital) - AM experts, e.g. infectious diseases specialists - Pharmacists (community and hospital) - Microbiologists - Epidemiologists and public health practitioners

Appropriate administration and de-escalation of antibiotics How?	- Optimise dosing (ie never use "low dose") - Review microbiology and clinical status at 48-72 hours to decide: stop, switch, continue, modify - Administer short antibiotic courses as appropriate - Therapeutic drug monitoring - Appropriate prophylactic use of AMs	Restrict formulary for empiric treatment at 48 hours for inpatients to encourage review of prescriptions and de-escalation Include recommendations for iv to oral switching and outpatient parenteral antibiotic therapy (OPAT) in guidelines	Ensure availability of paediatric formulations to overcome need for manipulation of AMs e.g. solid forms, and to ensure appropriate dosing Use antimicrobial batching to maximize use of antimicrobials for a specific duration and at a specific dose	- Pharmacists (community and hospital) - First contact AB prescribers (community and hospital) - AB champions who can provide AS interventions - AM experts, e.g. infectious diseases specialists - Microbiologists - Pharmaceutical companies (including generics manufacturers)
Use of expertise and resources Resources	- Establishment of AS teams/committees and identification of AS champions - Administrative and leadership support - Collaboration with manufacturers	Form stewardship teams building on locally available expertise and with support from regulatory and management bodies	Identify local antibiotic champion and provide training ("knowledge brokers")	- AB champions as lead - All of the above - Healthcare managers, administrators and funders
Continuous and transparent monitoring of antibiotic use and antimicrobial resistance Information	- Audit and feedback - Education - Prospective monitoring of relevant outcomes - Benchmarking	Ensure on-going, prospective and openly accessible (at local or higher level) monitoring of key parameters to identify areas for intervention Involve prescribers in the	Use run charts and other simple devices to provide immediate feedback on the success of implementing key stewardship activities Foster co-operation and data sharing between	- Microbiologists - Pharmacists (community and hospital) - Epidemiologists - Public health practitioners - Regulatory bodies

ACCEPTED