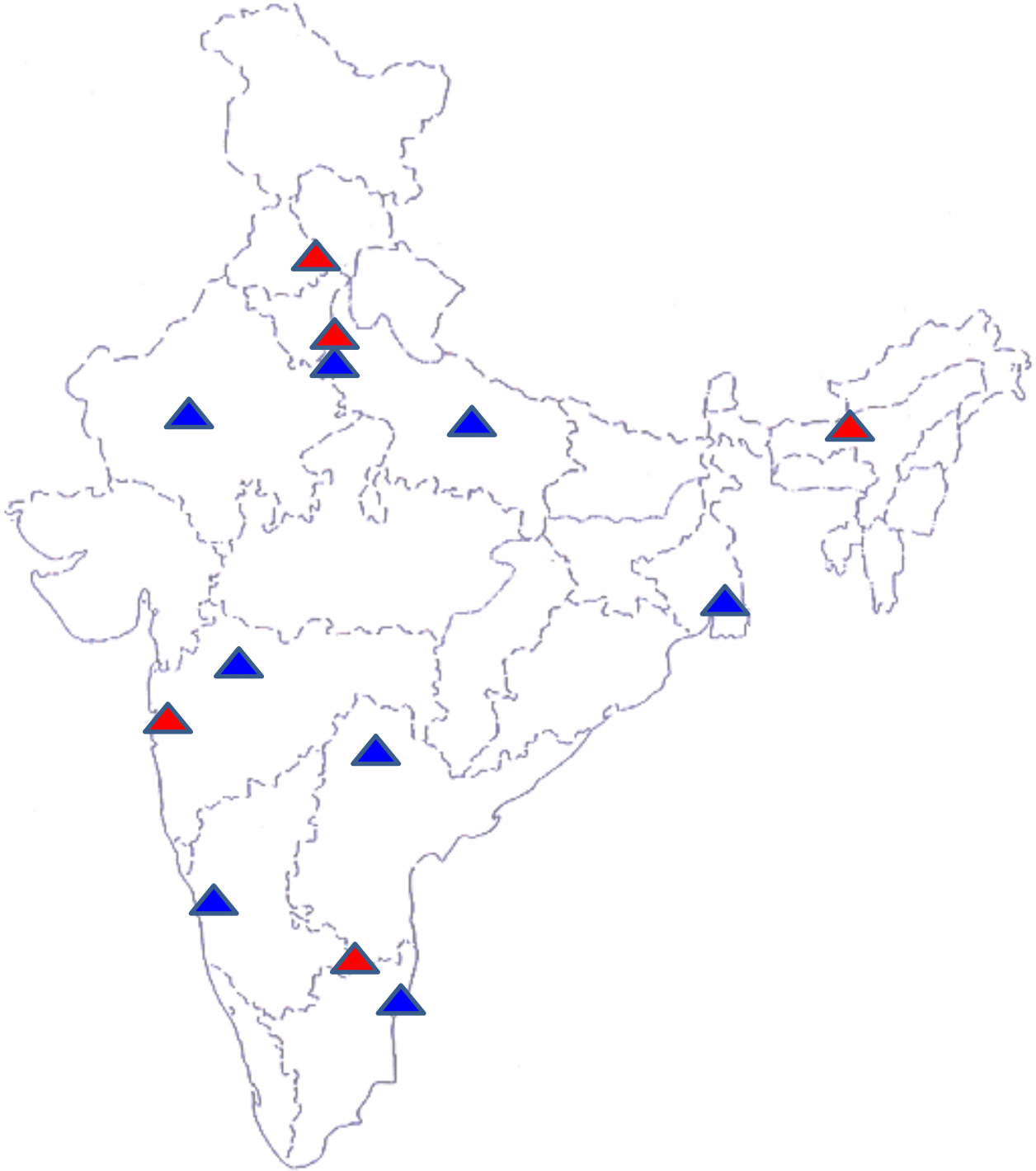
Capacity Building and Strengthening of Hospital Infection Control to detect and prevent Antimicrobial resistance in India

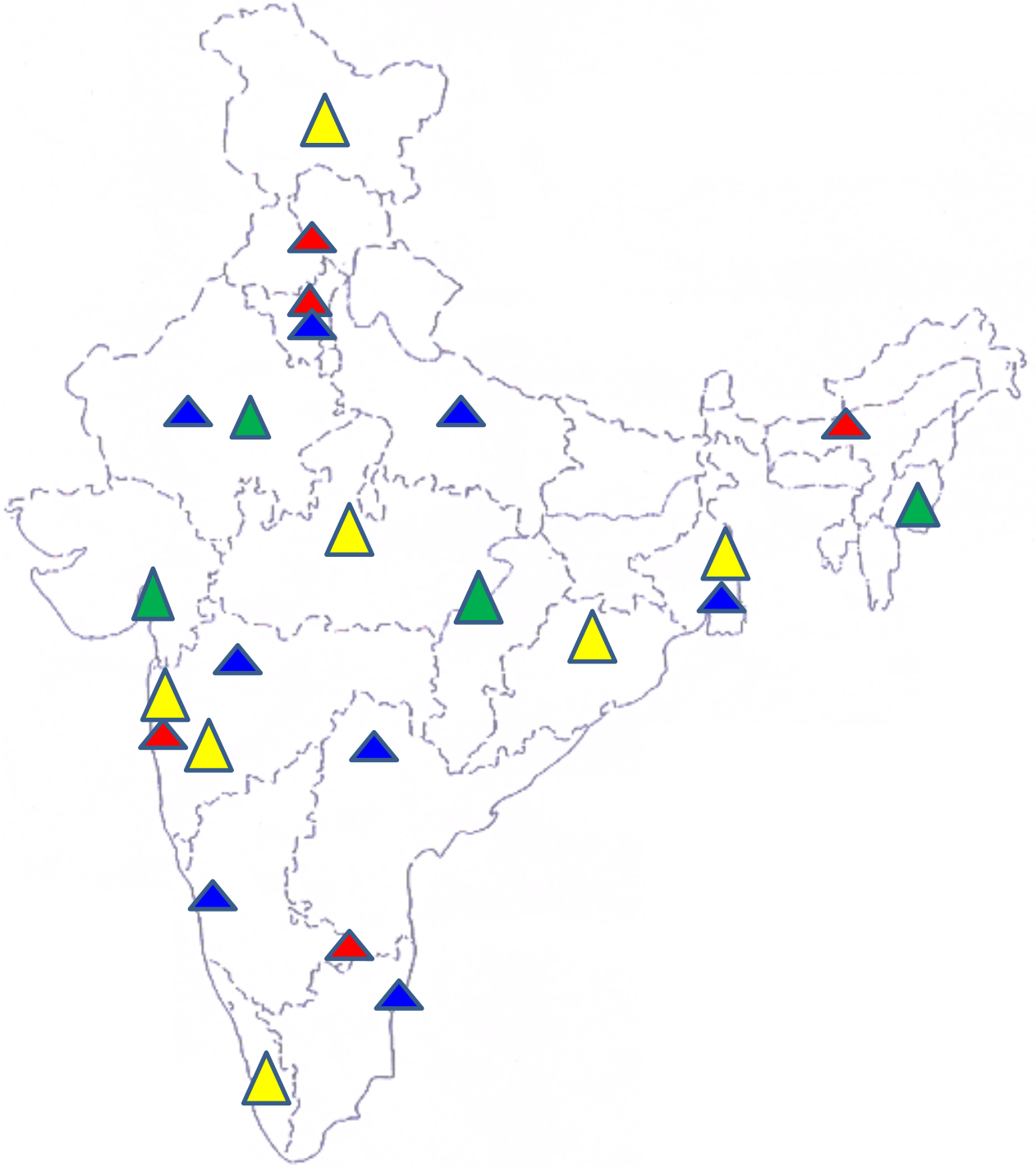
All India Institute of Medical Sciences, New Delhi

- Started 29th Sept, 2015
- 5 sites
- 13 Sites
- Scaled up to 24
  - 32
- All regions of India
- Activities
    - Surveillance of Hospital acquired infections
    - Laboratory strengthening
    - EQAS
    - AMSP
    - Public Health Workforce development
    - Investigation of outbreaks

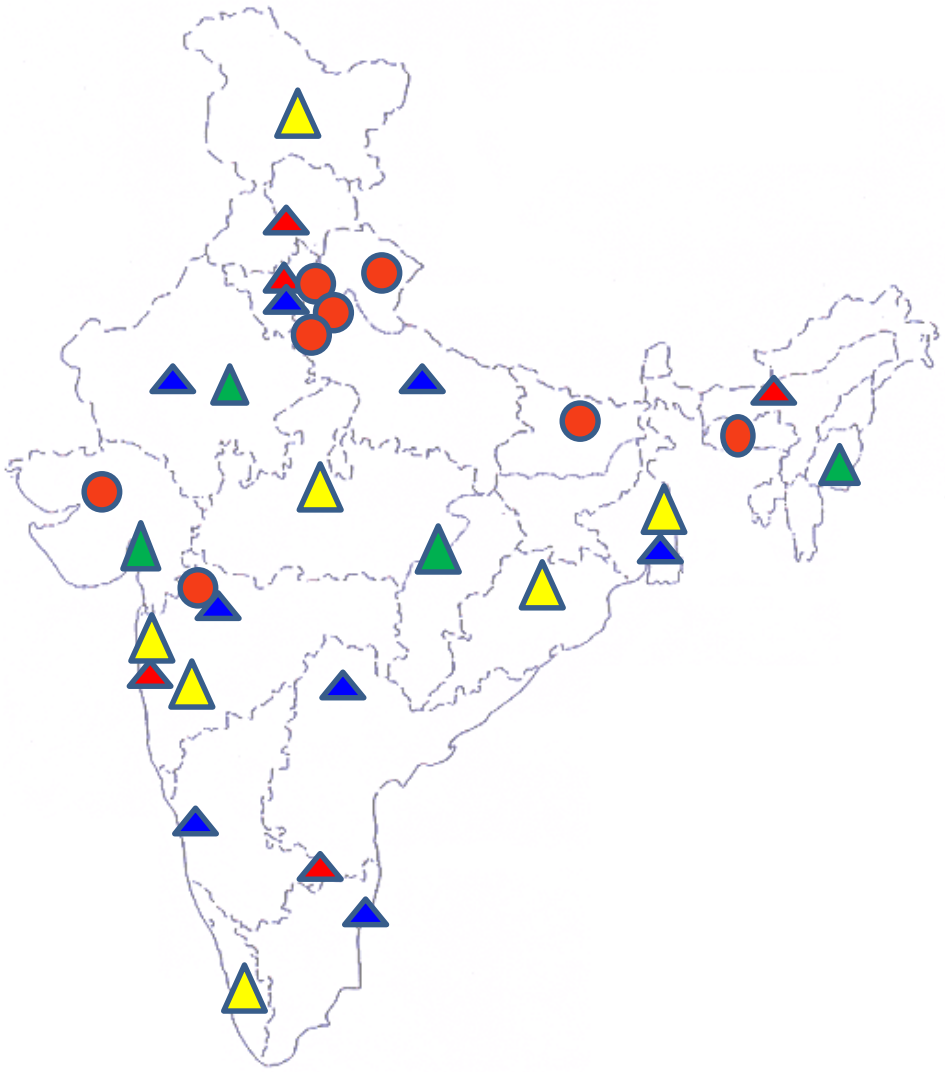
Network
82 ICUs

- Phase I – 5 Centres (16 ICU) – October 2015
- Phase II – 8 Centres (26 ICU) – October 2016
- Phase III – 7 Centres (24 ICU) – October 2017
- Phase IV – 4 Centres (16 ICU) – October 2017





24 Hospitals



1. Jammu and Kashmir
2. Chandigarh
3. Uttarakhand
4. Delhi
5. Rajasthan
6. Gujarat
7. Madhya Pradesh
8. Uttar Pradesh
9. Bihar
10. Chhattisgarh
11. Odisha
12. West Bengal
13. Manipur
14. Meghalaya
15. Assam
16. Andhra Pradesh
17. Karnataka
18. Tamil Nadu
19. Kerala
20. Maharashtra

Plan for 2018 and Beyond

- 24 ICMR sites
- 4 NCDC sites
- All recipients of Swachhta action plan funds
- Additional NCDC sites
- IAMM/ HISI
- Horizontal expansion within Hospitals….

BSI and UTI data Analysis

May 2017- November 2017

BSI Surveillance

- Total Number of ICU : 82
- Total No. of patients : 104,408
- Central Line Days : 34,160

BSI Surveillance

- CLABSI Primary BSI : 299 (40.8%)
- Non CLABSI Primary BSI : 244 (33.3%)
- Secondary BSI : 178 (24.3%)
- Not Classified : 11 (0.2%)
- Total BSI : **732**

BSI Rate (Network)

Episode	Rate
CLABSI	8.75
DUR	0.32
Primary BSI	5.20
Secondary BSI	1.70
Total BSI	6.90

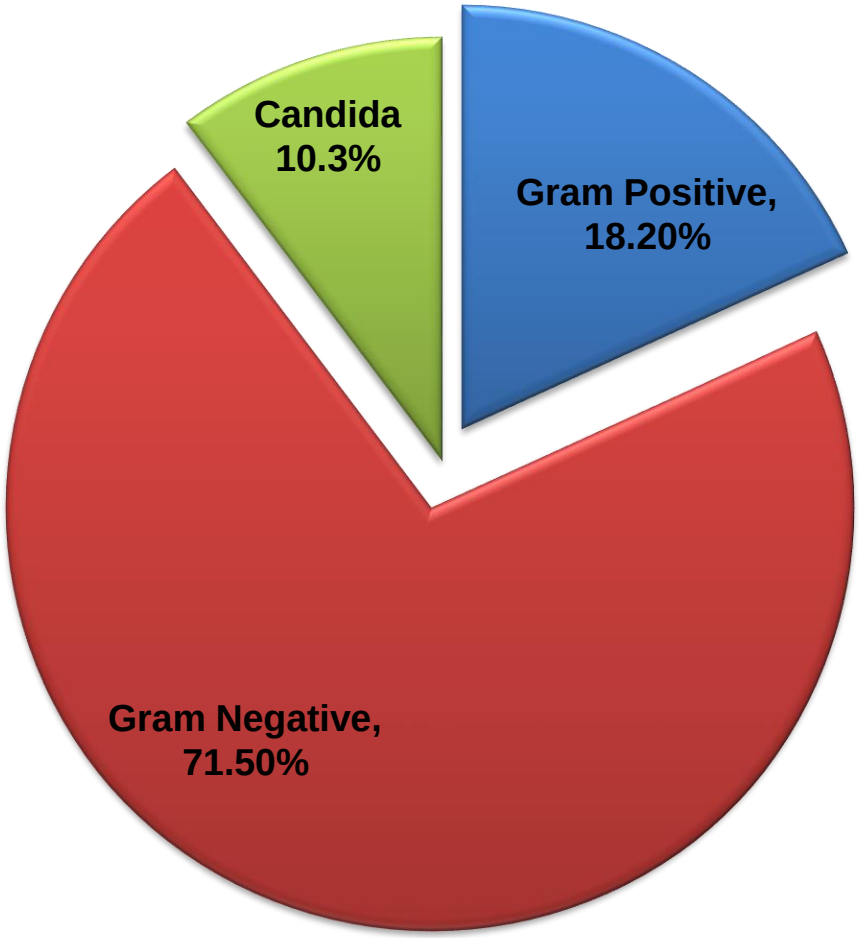
Phase I (BSI Incidence)

Centre	CLABSI rate	DUR	Primary BSI	Secondary BSI rate	Total BSI rate
1	8.85	0.61	6.44	4.88	11.33
2	22.99	0.06	8.39	0	8.39
3	4.03	0.72	3.56	2.78	6.34
4	3.51	0.38	2.37	0.56	2.93
5	10.62	0.35	5.58	1.57	7.16

Phase II (BSI Incidence)

Centre	CLABSI rate	DUR	Primary BSI	Secondary BSI rate	Total BSI rate
6	9.97	0.58	1.85	4.32	11.99
7	13.36	0.32	1.2	1.2	6.8
8	13.49	0.19	3.41	0.29	6.38
9	4.03	0.6	0	0.7	3.16
10	12.38	0.52	0.81	0.81	8.13
11	12.76	0.13	1.91	1.22	4.9
12	2.38	0.03	6.82	0	6.91
13	8.48	0.2	1.11	2.98	5.84

Distribution of BSI Organism (May17-Nov 17)



% Distribution of BSI Pathogen (May 17- Nov 17)

Organism	Number	%
Klebsiella pneumoniae	168	21.3
Acinetobacter spp.	157	19.9
Pseudomonas spp.	56	7.11
Candida Spp.	107	13.59
Escherichia coli	44	5.59
Enterobacter spp.	39	4.95
Burkholderia spp.	24	3.04
Stenotrophomonas maltophilia	13	1.65
Serratia marcescens	11	1.39
Enterococcus spp.	63	8.0
Staphylococcus aureus	45	5.71
CONS	19	2.41
Others	41	5.20
	787	

% Resistance (GNB)

Antibiotics	*Klebsiella pneumoniae* (%)	Escherichia coli (%)	Acinetobacter Spp. (%)	Pseudomonas spp. (%)
Amikacin	98/ 148 (66.21)	18/42 (42.85)	98/114 (85.96)	27/51 (52.94)
III Gen Ceph	82/89 (92.13)	24/27 (88.88)	115/129 (89.14)	26/48 (54.16)
Carbapenems	89/146 (70.63)	18/41 (43.90)	115/132 (87.12)	25/43 (58.13)
Ciprofloxacin	108/141 (76.59)	35/39 (89.74)	100/121 (82.64)	20/45 (44.44)
Colistin	18/128 (14.0)	0/36 (0%)	5/116 (4.31)	3/33 (9.0)
Pip/ Taz	112/150 (74.66)	29/42 (69.04)	106/125 (84.8)	21/49 (42.85)
Tigecycline	32/123 (26.01)	0/29 (0)	1/12 (8.33)	1/2(50.0)
tobramycin	10/10 (100)	1/2 (50)	24/38 (63.15)	13/22 (59.09)

% Resistance (GPC)

Antibiotics	***Staphylococcus aureus (%)***	***CONS (%)***	***Enterococcus spp (%)***
Methicillin	11/1 (68.75)	3/4(75)	2/4 (50)
Vancomycin	1/37 (2.70)	0/19 (0)	15/59 (25.42)
Linezolid	1/38 (2.63)	0/12 (0)	3/54 (5.55)
Tetracycline	9/27 (33.33)	0/1 (0)	9/13 (69.23)

UTI Analysis, May-November 2017

UTI (Network rate)

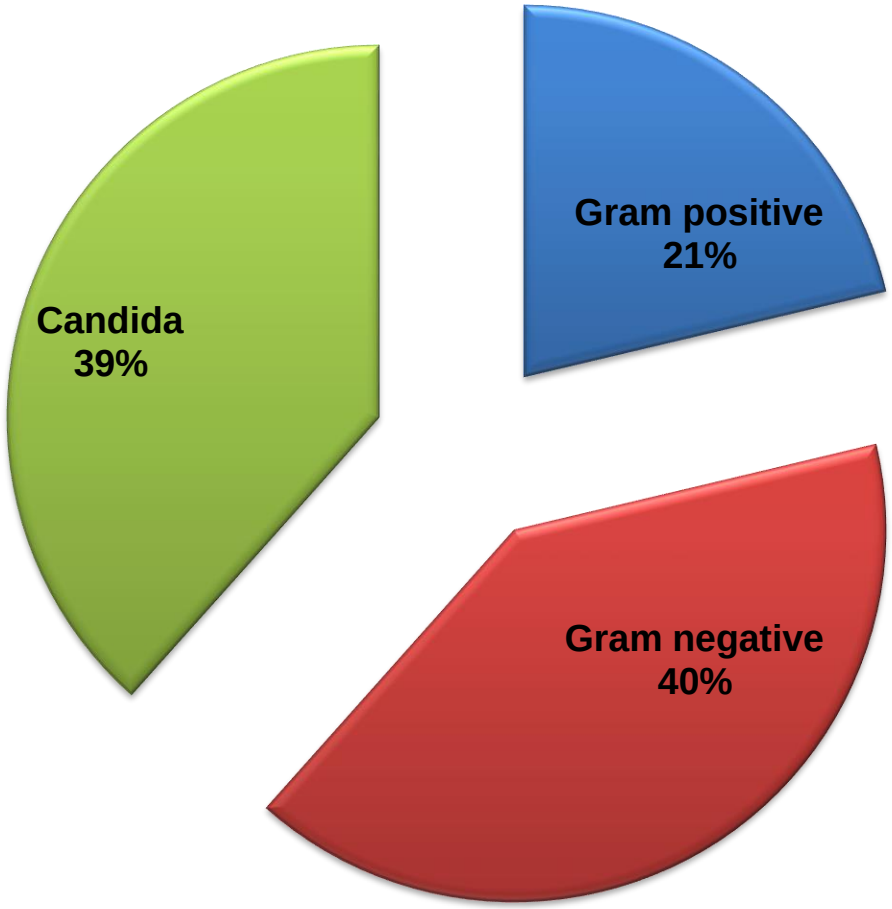
- Patient days : 104,408
- Foleys days : 62,528

- CAUTI : 187
- Non-CAUTI : 11
- Total UTI : 198

- CAUTI rate : 2.99
- DUR : 0.59

- UTI rate : 0.10
- Total UTI Rate : 1.89

Distribution of UTI Organism (May17-Nov17)



% Distribution of UTI Pathogen (May 17-June 17)

Organism	Number	%
Klebsiella pneumonia	24	11.11
Acinetobacter spp.	7	3.24
Pseudomonas spp.	16	7.40
Candida Spp.	77	35.64
Escherichia coli	26	12.03
Enterobacter spp.	2	0.92
Burkholderia Spp.	0	0
Stenotrophomonas maltophilia	0	0
Serratia marcescens	0	0
Enterococcus Spp.	46	21.29
Staphylococcus aureus	1	0.46
CONS	0	0
Others	17	7.87
	216	

% Resistance (GNB)

Antibiotics	***Klebsiella pneumoniae* (%)**	***Escherichia coli* (%)**	***Acinetobacter* Spp. (%)**	***Pseudomonas* spp. (%)**
Amikacin	12/22 (54.54)	11/24 (45.83)	5/6 (83.33)	13/14 (92.85)
III Gen Ceph	9/10 (90)	8/10 (80)	4/4 (100)	10/11 (90.90)
Carbapenems	13/22 (59.09)	7/22 (31.81)	4/5 (80)	9/14 (64.28)
Ciprofloxacin	13/24 (54.16)	18/20 (90)	6/6 (100)	11/12 (91.66)
Colistin	2/17 (11.76)	0/17 (0)	0/3 (0)	0/12 (0)
Pip/ Taz	13/20 (65)	12/19 (63.1)	5/5 (100)	10/14 (71.42)
Nitrofurantoin	4/10 (40)	10/15 (66.66)	4/4 (100)	4/4 (100)

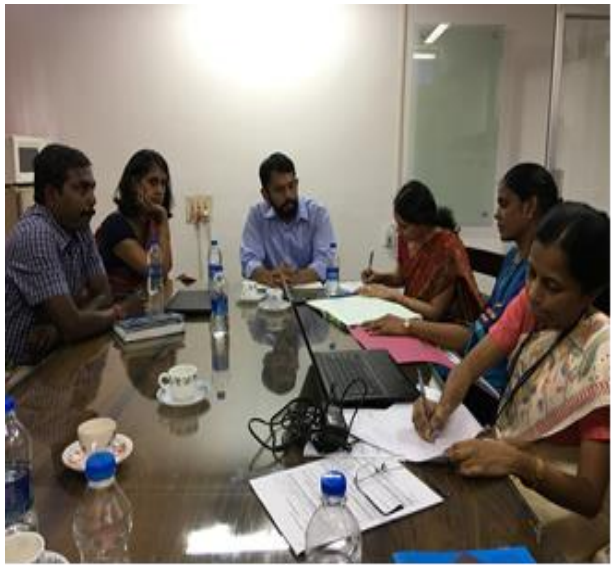
% Resistance (GPC)

Antibiotics (Gram Positive)	***Staphylococcus aureus* (%)**	**CONS (%)**	***Enterococcus* spp (%)**
Methicillin	-	-	6/8 (75)
Vancomycin	-	-	12/45 (26.66)
Linezolid	-	-	4/41 (9.75)
Tetracycline	-	-	4/5 (80)
levofloxacin	-	-	9/9 (100)
Nitrofurantoin	-	-	22/24 (91.66)

% Resistance (Candida)

Antifungal	**Candida spp (%)**
Amphotericin	17.39
Anidulafungin	22.22
Caspofungin	4.2
Fluconazole	22.80
Flucytocin	0
Itraconazole	16.66
Micafungin	0
Voriconazole	9.09

Site Visits of various centers



AMSP

- Four workshops were conducted for training all 20 centers.
- A few other centers from the ICMR-AMR network and members from NCDC participated in these workshops.
- Four regions of India (North: Delhi; South: Chennai; East: Kolkata; West: Mumbai).
- Led by the Indian Council of Medical Research.
- Key areas for initiating a network-wide AMSP were identified.

- **Lab Assessments**

- **EQAS**

Impact

- Trainings: attended by other network participants
- Total staff trained: > 150
- To be scaled up to 24 centers
- Almost 82 ICUs performing surveillance based on uniform criteria
- National Benchmarks
- Preventive protocols/ Bundles based on Indian data
- Ultimately help in reducing the burden of preventable HAI morbidity and mortality

Success Story

- This network is paving the way for development of a sustainable Surveillance system for Hospital acquired Infections in a uniform manner.
- The development of a tier II EQAS with participation of ICMR AND NCDC Centers would exemplify a unified approach to AMR quality control
- AMSP: First such initiative on a National Scale
- Development of a network of hospitals in each region of India that have labs strengthened to accurately detect emergent AMR threats

Regional Trainers

- Data quality
- Sustainability
- Further expansion
- Sustained trainings, support within and between hospitals