CONCLUSION

Antibiotic resistance is a key threat facing humanity worldwide and has been declared so by health organizations like the World Health Organization (WHO) and European Committee on Antimicrobial Testing (EUCAST). One of the most important factors that govern its importance is its major role in clinical and hospital setting.

1. *Escherichia coli* infections are more common in females and contribute to urinary infections while *Klebsiella pneumoniae* infections are common to both men and women mostly as a nosocomial pathogen.

2. Age is not a necessarily factor to bacterial infections although elderly individuals above 60 years of age are prone to infection; perhaps due to compromised immune fight back.

3. Depending on the pharmacokinetic and pharmacodynamic properties of imipenem, it can be touted to be the only antibiotic that could be helpful in treating infections in the state. However, ceftriazone and combinatorial therapy is a means of antibiotic therapy.

4. NDM being highly evolved and with rapid dissemination, the onset of OXA-48 and the predominance of ESBL producers in the state call for antibiotic surveillance policies.

5. When an isolate coproduces ESBL genes and NDM, NDM is preferentially expressed. Upon doses related to it MIC or double the MIC content, the growth of clinical isolates *in vitro* is slowed down but is not bactericidal.

6. The circulating isolates of *Escherichia coli* and *Klebsiella pneumoniae* belong to newer phylogroups not found or reported in other parts of India; could be a dissemination of strains/STs from neighbouring countries like Bangladesh, and states.

7. The Sequence types that exist among the population in Assam are ST1303, ST246 and among *K. pneumoniae* nosocomial isolates.

8. *Escherichia coli* and *Klebsiella pneumoniae* isolates circulating in India occupy unique place in the evolutionary tree.
Figure – 38: A flow chart representing the prevalence of antibiotic resistant genes in the clinical bacterial isolates collected for this study.