NZ NAC New Zealand National Antimicrobial Susceptibility Testing Committee

October 2018

Introduction from the Chair

Dear colleagues,

We are pleased to issue the first newsletter of the NZ National Antimicrobial Susceptibility Testing Committee (NZ NAC). The NZ NAC was formed in late 2017 in response to the EUCAST recommendation for countries to institute national antimicrobial susceptibility testing committees. The principal objective of the NZ NAC is to provide expert advice and to facilitate skill development in the area of antimicrobial susceptibility testing in NZ.

The NZ NAC was established with guidance from the New Zealand Microbiology Network (NZMN) as a year one action of the New Zealand Antimicrobial Resistance Action Plan. NZ NAC membership includes 6 clinical microbiologists and 6 senior microbiology medical laboratory scientists from multiple laboratories across New Zealand including ESR. More information on the membership and function of the NZ NAC can be found on the following webpage of the NZMN website.

Thanks to all who took the time to respond to the survey sent out earlier in the year. It was particularly helpful to have your feedback on areas the NZ NAC might work on.

We hope you find the newsletter helpful.

If you have any questions or feedback about the newsletter or about the function or role of the NZ NAC, please don't hesitate to contact the NZ NAC through Sarah Underwood at Sarah.Underwood@esr.cri.nz .

Sincerely,

Josh Freeman
Chair, NZ NAC

Minimum laboratory requirements for the detection of CPE from clinical samples and screening specimens

Click here to access the newly published NZ NAC document for laboratory detection of CPE in New Zealand. It is critical that microbiology laboratories can accurately and consistently detect and report CPE from clinical specimens. This document outlines the requirements for screening, identification, confirmation and referral of CPE isolates. It also specifies when notification to clinical and infection prevention teams is expected. This document has been endorsed by the New Zealand Microbiology Network and will be included as part of the Ministry of Health's New Zealand CPE Action Plan. Laboratories are urged to read and implement these recommendations as soon as possible.

Colistin antimicrobial susceptibility testing study

EUCAST have issued a warning regarding the poor performance of disc diffusion, MIC gradient strips and automated systems for reliably detecting colistin resistance in Gram-negative bacilli. The issues include the poor diffusion of colistin molecules into the agar, drug powder composition and heteroresistance. The discovery of a readily transferable, plasmid-mediated gene, *mcr*-1, has further complicated detection of resistance. As such, EUCAST currently recommends broth microdilution (BMD) as the only valid method to determine colistin susceptibility. The NZ NAC group conducted a small study to evaluate a variety of commercial methods for the detection of colistin resistance, including Liofilchem colistin MIC Test Strips, BD Phoenix NMIC-404, Rapid Polymyxin NP, Liofilchem SensiTest Colistin BMD, and Trek Sensititre EURGNCOL BMD. To see the results and conclusions of the study, click here.

Surveillance of colistin resistance in *E. coli* and *Klebsiella*

Following the first identification of an isolate with a mobile colistin resistance gene (an ESBL-producing *E. coli* with both *mcr-1* and *mcr-3* isolated in late 2017 from a patient who had travelled to Thailand in mid-2017), the NZ NAC has recommended that diagnostic labs should be requested to refer all colistin-resistant *E. coli* and *Klebsiella* to ESR for further investigation, including PCR for *mcr* genes.
The full list of antimicrobial-resistant organisms, that ESR has requested should be referred for surveillance, currently includes:

- Carbapenemase-producing Enterobacterales
- Colistin-resistant *Escherichia coli* and *Klebsiella*
- Vancomycin-resistant or linezolid-resistant *Enterococcus faecium* and *E. faecalis*
- *Neisseria gonorrhoeae* with decreased susceptibility to ceftriaxone or azithromycin resistance
- Vancomycin non-susceptible, daptomycin-resistant or linezolid-resistant *Staphylococcus aureus*

- Tetracycline-resistant methicillin-resistant *S. aureus* (for the surveillance of the livestock-associated CC398 clone)
- Penicillin non-susceptible *Streptococcus pyogenes*
- Organisms with other critical emerging resistance mechanisms
- Multidrug-resistant organisms associated with outbreaks (following consultation with ESR)

This list can be found on the ESR website at https://www.esr.cri.nz/our-services/consultancy/public-health/.

EUCAST news

From 1 January 2019, EUCAST will redefine the susceptiblity testing categories S, I and R. These will now be related to exposure of the infecting organism at the site of infection. With these new definitions and matching breakpoints, both "S" and "I" will encourage the use of the agent. The "I" should no longer be considered a buffer zone for poor precision in susceptiblity testing or to warn against uncertainty of the therapeutic effect. For more information click here

Haemophilus influenzae AST

Replies to the recent NZ NAC Antimicrobial Susceptibility Testing questionnaire indicated that several laboratories are having some difficulty with *Haemophilus influenzae* susceptibility testing, including an increase of β-lactamase-negative ampicillin-resistant (BLNAR) *H. influenzae*, after switching from CLSI to EUCAST. Canterbury Health Laboratories recently carried out a study, in conjunction with ESR, looking at 100 *H. influenzae* clinical isolates; measuring penicillin, ampicillin and cefuroxime disc zone sizes, as well as ampicillin MICs, using EUCAST guidelines. Analysis of *fts*I gene mutations (PBP3 substitutions) was performed by

ESR. The study found an excellent correlation between the EUCAST recommended screening method of penicillin 1 unit disc and *fts*I gene mutations, predominantly affecting cephalosporins rather than ampicillin. To read the whole study, click here

Summary of survey responses

Thank you to those who completed the antimicrobial susceptibility testing methods questionnaire earlier in the year. 23 laboratories responded to give a snapshot of current AST methods.

- 78% laboratories currently use EUCAST guidelines as their principal method.
- 44% laboratories are using automated AST methods, currently evenly split between Vitek and Phoenix systems.
- Identification of all significant Enterobacteriaceae to species level is done by 65% laboratories for urines and 87% laboratories for other sites.
- In laboratories which have a urine hospital testing antibiogram, nitrofurantoin and trimethoprim were included in all the antibiograms. In decreasing frequency the following antibiotics were also included in the hospital antibiograms: ampicillin, amoxicillin/clavulonic acid, ciprofloxacin, gentamicin,cephalexin, ceftriaxone, cefpodoxime, cefuroxime, co-trimoxazole, meropenem, norfloxacin, pip/taz, cefaclor, ertapenem, ceftazidime and cefoxitin.
- In laboratories which have a urine community testing antibiogram, nitrofurantoin and trimethoprim were included in all the antibiograms. In decreasing frequency the following antibiotics were also included in the community antibiograms: amoxicillin/clavulonic acid, ampicillin, cephalexin, ciprofloxacin, cefpodoxime, norfloxacin, co-trimoxazole, ceftriaxone, gentamicin, cefaclor and cefazolin.
- Just under half of laboratories had other specific urine antibiograms, e.g. for children. These had the following antibiotics in decreasing frequency:

ampicillin, nitrofurantoin, trimethoprim, amoxicillin/clavulonic acid, co-trimoxazole, gentamicin, ciprofloxacin, cephalexin, trimethoprim, ceftriaxone, cefpodoxime, ceftazidime, cefaclor, cefazolin.

- The most common triggers for further testing for resistance mechanisms in Enterobacteriaceae are: For AmpC - cefoxitin, cefpodoxime and ceftriaxone, for ESBL - cefpodoxime, ceftriaxone and ceftazidime and for CPE - meropenem and ertapenem.
- 70% laboratories were interested in some form of continuing education. Education bugs are underway.