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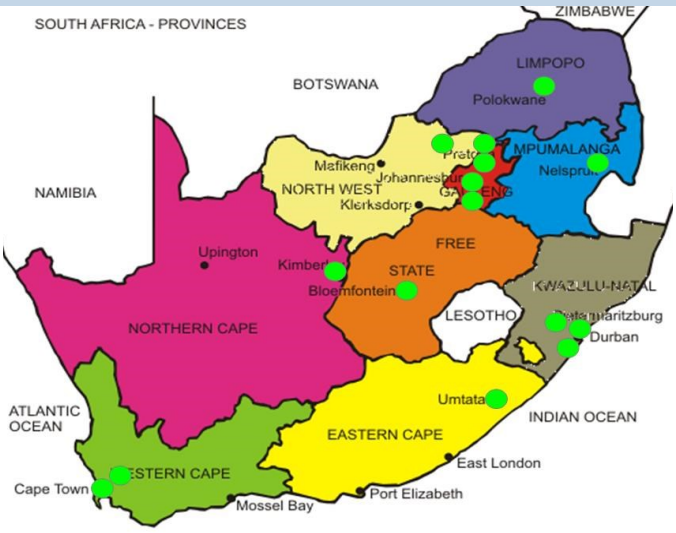


Volume 53, August 2017

May to August happenings

Please take time to enjoy the second LINK for 2017.

It's been another busy year for the GERMS-SA team; the highlight being our NICD GERMS-SA Surveillance Review in early June. We had an energetic programme and the meeting was well-attended by our GERMS-SA surveillance network (page 2). Olga Perovic (who heads up the Antimicrobial Resistance Laboratory) informs us about *Acinetobacter baumannii* (pages 3-5) and Liliwe Shuping writes about her findings on CRE surveillance as part of her surveillance evaluation for the Field Epidemiology and Training Programme (pages 5-6). A few or our newer projects (STI and HIV) at the clinics are briefly detailed on pages 7-8.

Teaching and training is core to the GERMS-SA programme and we give our staff the opportunities to write their perspective on what they learn. Read some views on the GCP course and Bereavement Training they attended (pages 8-9).

See the Enhanced Surveillance Site Operational Report summary (for January to March) on page 10. You can see how your site fared over the same time period the previous year and how your site compares to other sites.

The general information for surveillance organisms and specimen sending for laboratories are on pages 11 and 12.

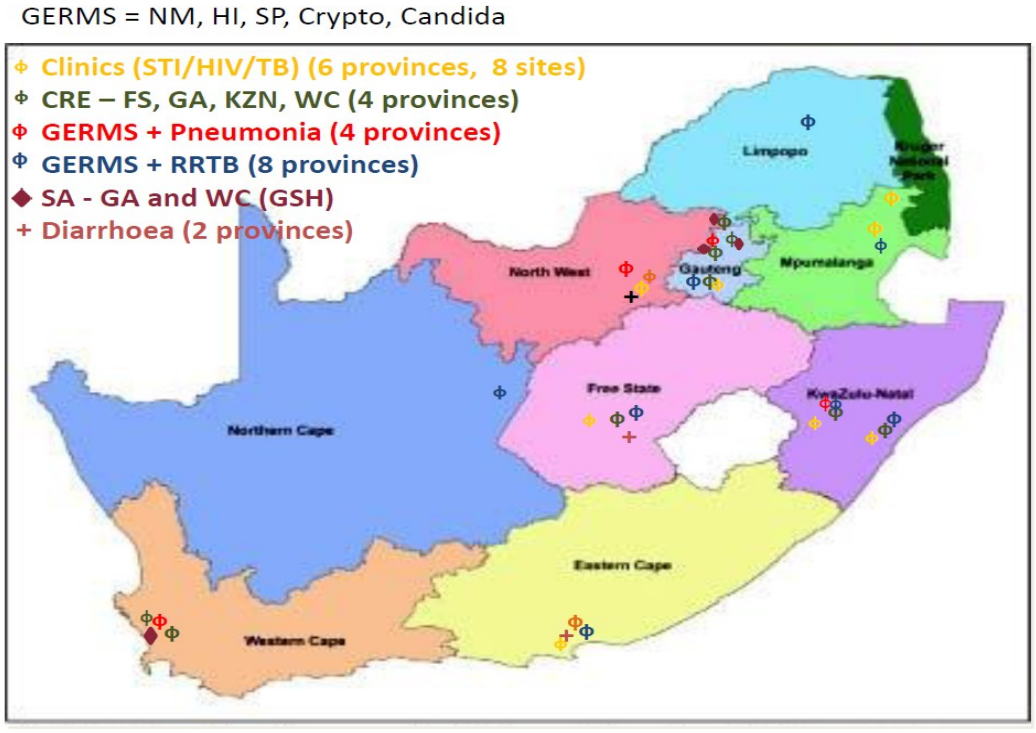
Remember you can order Dorset transport medium for free by calling the numbers on pages 11 and 12.

GERMS SOUTH AFRICA

NICD GERMS-SA Surveillance Review: June 8-9

Vanessa Quan

Our meeting was well-represented by our provincial network. We decided to showcase not only the GERMS-SA work but the important NICD projects like the Emergency Operations Centre (EOC) and the recent Life Esidemeni relocation of Mental Care Users, the roll-out of the Notifiable Medical Conditions and the National Cancer Registry. The GERMS-SA platform continues to support laboratory and syndromic surveillance nationally for pneumonia, meningitis, diarrhoea, TB, HIV and STIs.



NM = *N. meningitidis*, HI = *H. influenzae*, SP = *S. pneumoniae;* Crypto = *Cryptococcus spp;* RRTB = Rifampicin resistant TB; SA = *S. aureus;* CRE = Carbapenam Resistant Enterobacteriaceae

GERMS-SA laboratory and clinic surveillance sites

New organism under Laboratory-based Antimicrobial Resistance Surveillance for Nosocomial pathogens-*Acinetobacter baumannii*

Centre for Hospital Associated Infections, Antimicrobial Resistance and Mycosis (CHARM)

Olga Perovic

Antimicrobial-resistant bacterial infections are widespread in developed and developing countries. As the world is a global village and resistance spreads easily and quickly, there is no antimicrobial agent to which resistance has not developed over time. Increasing antimicrobial resistance presents a major threat to public health in relation to: a) reduced effectiveness of antimicrobial treatment options, b) increased morbidity and mortality as a direct result of resistance, and c) increased healthcare expenditure. Infectious diseases account for 45% of deaths in low-income countries. The estimated annual cost related to antimicrobial resistance exceeds $100 billion worldwide. Global strategies were introduced by the World Health Organization (WHO) with two important priorities in mind:

a) to organize surveillance to determine the extent of the problem and

b) b) to educate clinicians and the public on the appropriate use of antibiotics.

Different countries have developed a variety of well-known global surveillance programmes over time. In South Africa, the Department of Health has shown initiative and addressed issues on antimicrobial resistance in AMR National Strategy Framework. The South African Society of Clinical Microbiology passively collated antimicrobial resistance data from private and public sectors. GERMS-SA performs surveillance of community-acquired pathogens and follows resistance trends over time. In 2010, Laboratory-based Antimicrobial Resistance Surveillance (LARS) was established at the NICD. The vision of the LARS project was to establish a functional, integrated, AMR surveillance system for common, nosocomial, bacterial pathogens, particularly highly antibiotic-resistant ESKAPE organisms with the mnemonic acronym that represents: *Enterococcus, Staphylococcus, Klebsiella, Acinetobacter, Pseudomonas* and ESBL- *Enterobacter* and *E. coli*.

Laboratories performing phenotypic and genotypic characterization of mechanisms of resistance and molecular typing for ESKAPE organisms and analyses are part of CHARM at the NICD.

From 1st April CHARM planned the roll out surveillance for *Acinetobater baumannii* (AB).

Olga Perovic (far right) leads the CHARM antimicrobial resistance laboratory, pictured here.

Pathogen information

Acinetobacter organisms are gram-negative bacteria commonly found in soil and water. While there are many species of *Acinetobacter* that can cause human disease, *Acinetobater baumannii* accounts for about 80% of reported infections. The reservoir of AB is soil and water, but it can also be found on the skin of healthy people, especially in health care settings, and may survive in the healthcare environment for several days. AB may also colonize patients without causing infection or symptoms, especially in tracheostomy sites or open wounds. AB appears to be particularly effective at acquiring genetic material from other organisms and thus rapidly developing drug resistance.

Clinical manifestations

Clinical manifestations range from pneumonia to serious blood or wound infections. Infections can cause bacteraemia, pneumonia/ventilator-associated pneumonia (VAP), meningitis, urinary tract infection, central venous catheter-related infection, and wound infection. AB infection typically occurs in very ill patients and can either cause or contribute to death in these patients. Treatment of infections caused by AB is guided by *in vitro* antimicrobial susceptibility assays, but an optimal treatment for AB infections has not been established, especially for MDR-AB. Decisions on treatment should be made on a case-by-case basis by a health care provider. Clinicians should be guided in their choice of therapy by knowledge of the susceptibility patterns of strains present in their own geographical area. Extensively resistant AB strains remain generally susceptible to polymyxins (colistin - polymyxin B). Combination therapy has also been used. Peptides and other novel antibacterial agents for AB infections are in the experimental phase.

Resistance

Surveillance for MDR-AB involves *A. baumannii* resistant to multiple antibiotics, often defined as three or more antimicrobial classes (e.g. aminoglycoside, ampicillin-sulbactam, antipseudomonal carbapenem, antipseudomonal cephalosporin, fluoroquinolone).

Colistin resistance has emerged in the past few years. The chromosomally-mediated colistin resistance is due to modification of fitness and in lipid A. More recently, colistin resistance has been demonstrated by plasmid-mediated acquisition of the *mcr-1* gene. Except one report of *mcr-1* in *E.coli* in South Africa no other plasmid mediated resistance were reported.

Source of MDR-AB

MDR-AB infections occur most often in health care settings (hospital colonization and human reservoirs) housing very ill patients. They rarely occur outside of health care settings; however, community-acquired AB has been reported in China and tropical Australia, and has been mostly identified in patients with co-morbidity.

Route of transmission

Acinetobacter can be spread by person-to-person contact, contact with contaminated surfaces, or exposure in the environment (by colonized medical equipment). AB can enter through open wounds, catheters and tracheal tubes. Careful attention to infection control procedures, such as, **hand hygiene and environmental cleaning, can reduce the risk of transmission.**

Risk factors

People who have weakened immune systems, chronic lung disease, or diabetes may be more susceptible to infections with AB.

Hospitalized patients (particularly those in intensive care units), especially very ill patients on a ventilator, those with a prolonged hospital stay, or those who have open wounds (e.g. recent surgery or invasive procedure), are also at greater risk for AB infection.

AB was selected as it is an emerging multidrug-resistant (MDR) pathogen in health care settings, especially in the intensive care setting. Thus, it is essential that rates of infection and AMR of this organism are monitored to guide infection prevention and control practices and improve patient safety through prevention of spread in healthcare settings.

Findings from an evaluation of the GERMS-SA carbapenem-resistant Enterobacteriaceae surveillance system in Gauteng, July 2015 – July 2016

Centre for Hospital Associated Infections, Antimicrobial Resistance and Mycosis (CHARM)

Liliwe Shuping

Enterobacteriaceae are a group of Gram-negative bacteria colonizing humans with the possibility of causing severe and life-threatening infections. Due to inappropriate and prolonged use of antibiotics, Enterobacteriaceae have developed resistance to multiple antibiotic classes. What is of most concern is the development of resistance to carbapenems, the last line class of antibiotics used to treat infections that commonly occur among immunocompromised patients admitted to intensive care units, those undergoing surgical procedures and those exposed to invasive medical devices such as urinary catheters and ventilators. Infections with carbapenem-resistant Enterobacteriaceae (CRE) are therefore difficult to treat and often result in high death rates due to treatment failure of alternative therapies.

Due to the public health impact of CRE, there has been global efforts to control and prevent these infections. In order to achieve this, it is crucial that these infections are monitored, ideally through information systematically collected through a surveillance system. In South Africa, CRE were introduced in the GERMS-SA surveillance system in 2015.

Because it was important to ensure that the system was collecting valuable data that can inform infection control programmes and meet other important objectives, the initial performance and effectiveness of the system in Gauteng was evaluated one year after its introduction (July 2015 – July 2016). The system was evaluated using the Centers for Disease Control and Prevention guidelines. Data were collected from the CRE surveillance database, surveillance documents, and questionnaires distributed to healthcare workers participating in the system.

The results showed that majority of users had good knowledge about the public health importance of CREs.

The structure and operation of the system was simple. The data collected by the system was of good quality, although >25% of information on fields such as source of infection and medical devices was missing. Majority of healthcare workers (67.7%) did not know how data collected by the system was used, and no reports using data from the system had been published. Analysis of the patients with CRE infections reported to the system showed that *Klebsiella pneumoniae* was the most common organism (71.9%), and OXA -48 was the most predominant carbapenem-resistance gene (46.5%). Important known risk factors such as surgery and antibiotic exposure were seen in 30% of these patients. The death rate among patients was 43.6%.

Overall, the evaluation showed that the system's initial performance was sufficient. In order to enhance the system's performance, challenges identified through the evaluation should be addressed and data from the system should be analysed and disseminated in order to demonstrate the system's usefulness. Given the high death rate among patients with CRE infections, stricter infection prevention and control activities are warranted. Among other things, healthcare workers should consider surgery and antibiotic use when designing and implementing these infection prevention and control interventions.

GERMS-SA/SARI: Happenings

RMMCH staff threw a baby shower for Phumelele (SO SARI). She is currently on maternity leave.

Thami (middle standing) prepared food for us and he is actually a good cook.

GERMS-SA: Surveillance and Training opportunities

Vanessa Quan and Linda Erasmus

STI Surveillance activities 2017

STI surveillance is important to assess aetiologies of STIs (male urethritis syndrome, vaginal discharge syndrome and genital ulcer disease) and to monitor gonococcal resistance since STIs are managed syndromically. Alex clinic in Gauteng is the long-established STI clinic for NICD surveillance. Since 2016 STI surveillance (using the GERMS-SA platform) has been rolled out to selected clinics nationally. This surveillance will take place every 2 years in some places and annually in some provinces. STI surveillance gives the GERMS-SA surveillance officers a chance to broaden their skills and knowledge. So far we have covered STI surveillance in KZN, MP, NW in addition to GA. Free State and EC have started.

Training of Surveillance Officers at NICD

Professional nurses from the Free State and Eastern Cape (Khasi Mawasha and Badikazi Matiwane) were trained on STI surveillance to be performed at Heidedal (FS) CHC and Zidwe clinic (EC). The training covered patient recruitment, completing the new questionnaire, sample collection and transport and patient management.

Western Cape Surveillance

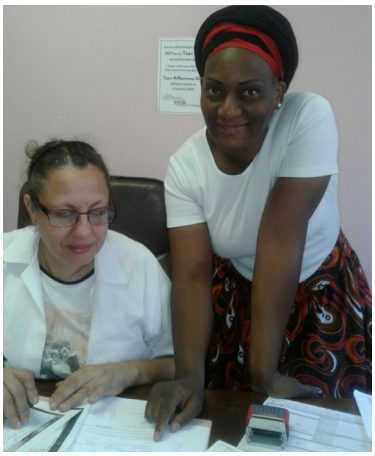
Surveillance started in Khayelitsha in mid-June. They are doing MUS and male GUS at Site B Male, VDS and female GUS at Nolungile CDC and HPV at Site C Youth. Permission from both City of Cape Town Health and WC Provincial department of health (as Nolungile is a shared site) was received.

Badikzai Matiwane is doing STI surveillance at Zwide clinic, in Port Elizabeth

HIV DRUG RESISTANCE IN PAEDIATRIC PATIENTS RECEIVING ART IN SOUTH AFRICA

Khasiane Mawasha

The study started in Bloemfontein at Heidedal Clinic on February 2017. We recruit and enroll all paediatric patients who come for follow up at the clinic.



Above: Sr Khasi with Dr. Abrams at the clinic.

Inclusion criteria:

All patients up to 19 years, who are HIV infected and are currently on ART for at least 3 months, who have evidence of virological failure i.e. have had a recent viral load of 1000 copies/ml and more, and have not changed regimen since the most recent viral load.

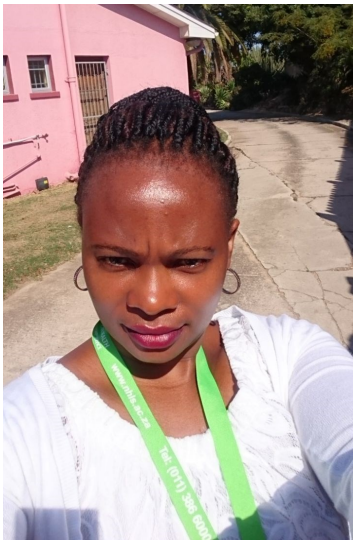
Consenting:

For children 6yrs and younger the guardian signs/give consent, for children 7-14yrs both the child and parent/guardian signs, children older than 14yrs attending alone can give assent then the consent and information sheet should be taken home for parent/guardian to sign and returned to clinic as soon as possible.

Participants who are 18-19 sign on their behalf. All participants have to sign both consent for study and consent of storage of remaining samples for future use.

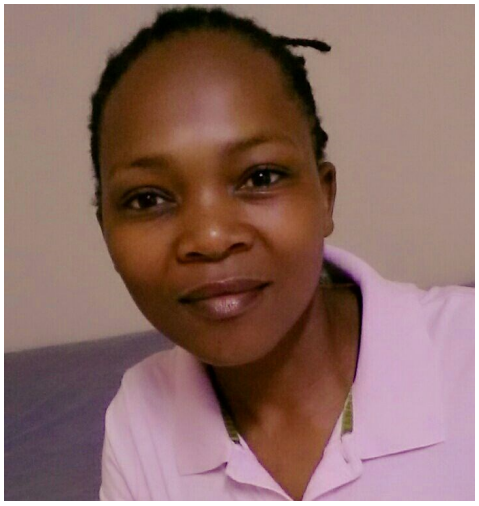
We have to enroll 33 participants. Up to 23 March 2017 16 participants have been enrolled. Dr. Abrams, the paediatrician dealing with these patients, has been very helpful and understanding. It has been a nice experience doing this study, though it is sad to see kids with virological failure. My wish is to see all HIV infected people on treatment being virologically suppressed.

GOOD CLINICAL PRACTICE (GCP) and BEREAVEMENT COUSELLING COURSE: Feedback from SOs and CSAs



Bongiwe Cetywayo: GCP training

The training was good and very informative. I learnt a lot from it, e.g. the importance of the consent and the right way of doing it. The reasons behind the GCP itself and why we should be doing things according to its guidelines. I liked the fact that the facilitator was very clear in her explanations. She was also patient with everyone and also answered all our questions in a satisfying way. Although it was lots of information to take in, time was limited, she had to skip some of the things but also explained that it was not relevant to us as we are not doing a study with Investigation Products. Except for the time not being enough everything else was fine.



Busisiwe Zungu: Bereavement counselling

I learned that it is important to understand what the patients or relatives are feeling or going through when we approach them. I also learned that it is important to know the different stages of grief, We had a session where we had role plays on different stages of grief. We learned what each of us goes through when we are dealing with patients and relatives. When our patients are grieving we also experience their pain.

GCP training – I learned about the incidents that happened before the regulations e.g. the Declaration of Helsinki existed. I learned the importance of consenting and that we should not rush to get the numbers and compromise quality of work. I learned that it is important to explain the work we do in the language (mother tongue) that the patient understands. I also learned that the data I collect should be reliable and verifiable. It was important for me to attend the training. Thank you for the opportunity.

Sebongile Rasmeni—Quariva: *GCP training*

I learned so much, so much about the principles of GCP and the requirements of the Ethics Committee. The laws put in place to protect the public. The international laws and laws introduced by each country for the purpose of protecting their people from being exploited by harmful procedures . I learned about clinical trails , the reporting of adverse events, the importance of an informed consent as well as the monitoring processes.

Sesing Tsabane: *GCP training*

It was good to be part of the course. We learned things that we didn't know and some of them we already knew. GCP is all about being professional when dealing with patients and completing the Case Report Form (CRF). When you see a mistake on a CRF, draw a line through it, write your initials and date next to the line, that you have corrected the mistake, not the date that you have completed the case report form.

If a patient can't read or write his/her name, you take a thumb print and you must have a witness. The witness should not be a sister that work in hospital or someone that work there, it must be another patient.

GERMS-SA Enhanced Surveillance Site Operational Report Summary, January to March 2017

JANUARY TO MARCH 2016									JANUARY TO MARCH 2017						
Lab confirmed cases	# CRFs completed	# None*	% CRFs	# Interview	% Interview	Organisms**	Province	ES Site	Organisms**	Lab confirmed cases	# CRFs completed	# None*	% CRFs	# Interview	% Interview
80	41	0	51	31	76	A, B, C, H	EC	PE/ Dora/ Livingstone	A, B, C, H	68	55	0	81	27	49
43	26	0	60	14	54	A, B, C, G, H	FS	Universitas/ Pelonomi	A, B, C, G, H	77	63	0	82	44	70
237	128	0	54	98	77	A, B, C, F, G, H	GA	CHBAH	A, B, C, F, G, H	259	178	10	69	117	70
172	160	1	93	151	94	A, B, C, D, G, H	GA	CMJAH	A, B, C, D, G, H	189	169	0	89	129	76
61	6	0	10	6	100	A, B, C, G, H	GA	DGM	A, B, C, G, H	73	53	7	73	41	89
N/A	N/A	N/A	N/A	N/A	N/A	N/A	GA	Milpark/ Pta East/ Sunn	C	31	22	1	71	7	33
110	92	0	84	80	87	A, B, D, H	GA	RMMCH/ HJH	A, B, D, H	151	133	4	88	107	83
107	80	0	75	50	63	A, B, C, D, G, H	GA	SBAH/ TDH	A, B, C, D, G, H	101	98	0	97	78	80
18	14	0	78	14	100	A, B, C, G, H	KZ	Addington	A, B, C, H	14	3	0	21	3	100
117	115	0	98	112	97	A, B, C, F, H	KZ	Edendale/ Northdale	A, B, C, F, H	108	102	0	94	101	99
37	29	0	78	23	79	A, B, C, G, H	KZ	KEH/ IALCH	A, B, C, G, H	47	40	1	85	38	97
26	20	0	77	20	100	A, B, C, G, H	KZ	RK Khan	A, B, C, G, H	49	40	0	82	36	90
44	12	0	27	11	92	A, B, C, F, H	LP	Polokwane/ Mankweng	A, B, C, F, H	51	40	0	78	30	75
67	46	0	69	45	98	A, B, C, F, H	MP	Rob/ Themba	A, B, C, F, H	133	119	0	89	104	87
49	45	0	92	34	76	A, B, C, F, H	NC	Kimberley	A, B, C, F, H	33	31	1	94	23	77
82	73	0	89	56	77	A, B, C, F, H	NW	Klerksdorp/ Tshepong	A, B, C, F, H	92	77	0	84	66	86
57	43	0	75	41	95	A, B, D, G, H	WC	GSH/ RXH	A, B, D, G, H	68	33	0	49	30	91
97	74	0	76	67	91	A, B, C, D, G, H	WC	Tygerberg	A, B, C, D, G, H	90	46	0	51	25	54
1,404	1,004	1	72	853	85	A, B, C, D, F, G, H		TOTAL	A, B, C, D, F, G, H	1,634	1,302	24	80	1,006	79

* Medical record not found/ patient not admitted to hospital/ patient refused consent

** A: *S.pneumoniae*, *H. influenzae*, and *N. meningitidis*; B: *Cryptococcus*; C: *Candida*; D: *S. aureus*; F: Rifampicin-resistant Tuberculosis; G: Carbapenem-resistant Enterobacteriaceae; H: *S*.Typhi

Target met	Target not met

Targets: ≥90% for CRFs completed; ≥70% for CRFs completed on interview

> The overall % of completed CRFs increased and % of interviews conducted decreased.
> 3 of 18 sites reached both targets for quantity of work (≥90% of CRFs completed, and ≥70% on interview), excellent!
> CMJAH, Rob/Themba, and RMMCH/HJH almost reached the 90% target for CRFs completed, well done.
> 15/18 sites exceeded the target of 70% for completed CRFs on interview. This is excellent for our data quality, well done!
> Edendale/Northdale, KEH, RK Khan, and GSH/RXH achieved ≥90% on interview, well done!

General Information for Surveillance Laboratories

ALL laboratories to send ALL isolates below

No cryptococcal isolates required—private labs to send a lab form only

GERMS-SA: ALL laboratories please submit the following bacterial or fungal pathogens to the National Institute for Communicable Diseases (NICD) on Dorset transport media with a TrakCareLab/private laboratory report or send specimen tube/blood culture bottle if uncertain of identification and/or no isolate available (contact lab).

Pathogen	Specimen	Lab tests	NICD Centre/ Lab
• *Streptococcus pneumoniae* • *Haemophilus* spp. • *Neisseria meningitidis*	All normally-sterile site specimens, e.g. CSF, blood, pleural fluid, peritoneal fluid, pericardial fluid, joint fluid, tissue, etc.	Culture positive **OR** Consistent Gram stain **OR** Latex positive	CRDM (011 555 0315)
• *Salmonella* Typhi • ††*Vibrio cholerae*	Any specimen	Culture positive	CED (011 555 0333/4)
• *Candida* spp. **(all laboratories)**	Blood culture only	Culture positive	COTHI - MRL (011 555 0384)

††*Vibrio cholerae* isolates from human and non-human (environmental) specimens must be reported to NDoH.

Should your laboratory suspect an OUTBREAK of *Shigella* spp, non-typhoidal *Salmonella,* diarrhoeagenic *E.coli,* non-cholera Vibrio, *Campylobacter* or *Listeria* spp please contact and submit isolates to the Centre for Enteric Diseases (011 555 0333). Please also call the NICD Outbreak Response Unit to alert them (011) 5550392/0542 or (011) 386 6354

To order a new batch of Dorset Transport Media, please call CHARM at telephone 011 555-0323/0381 For surveillance questions, please call GERMS-SA at telephone 011 386 6234.

In addition, certain sites are requested to send *Staphylococcus aureus* and Carbapenem-Resistant Enterobacteriaceae (CREs) and *Acinetobacter baumannii* to NICD.

Pathogen	Specimen	Lab tests	NICD Centre/ Lab
Cryptococcus spp. (Please send **cultured** isolates January to March **2017** inclusive)	Any specimen Private labs: Please only send a Lab form to the laboratory for case counting ESS laboratories: Please inform the SO about cases (January -March inclusive)	Culture positive **OR** CrAg test positive **OR** CSF India ink positive	CHARM - MRL (011 555 0384)
**Staphylococcus aureus*	Blood culture only	Culture positive	CHARM-AMRL (011 555 0342)
^Carbapenem Resistant Enterobacteriaceae (CRE): • *Citrobacter* spp. • *Enterobacter* spp. • *Escherichia coli* • *Klebsiella* spp. • *Morganella* spp. • *Proteus* spp. • *Providentia* spp. • *Salmonella* spp. • *Serratia* spp.	Blood culture only	Culture positive **AND** Non-susceptible (intermediate or resistant) to any of the carbapenems: ertapenem, meropenem, imipenem and/or doripenem	CHARM-AMRL (011 555 0342)
^*Acinetobacter baumannii*	Blood culture only	Culture positive	CHARM-AMRL (011 555 0342)

* Charlotte Maxeke Johannesburg Academic, Steve Biko Pretoria Academic, Helen Joseph , Groote Schuur, Tygerberg

^ FS: Universitas/Pelonomi
GP: Chris Hani Baragwanath Academic, Charlotte Maxeke Johannesburg Academic, Helen Joseph/Rahima Moosa, Dr George Mukhari and Steve Biko Pretoria Academic
KZ: Grey's, Northdale/ Edendale, Inkosi Albert Luthuli/King Edward Hospital, Addington and RK Khan
WC: Groote Schuur and Tygerberg

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This newsletter was compiled and edited by Vanessa Quan , Division of Public Health Surveillance and Response. Please send any queries, recommendations or contributions to: Vanessa Quan vanessaq@nicd.ac.za; Tel: **011 386 6012**