## Assessment of Emergency Medical Capability and Capacity Nauru 2016

s. 22(1)(a)(ii)

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## **Executive summary**

s. 22(1)(a)(ii) was engaged by the Department of Immigration and Border Protection to provide an overview of current capacity and capability of health services contracted by the Department as well as local services available to respond to a health emergency on Nauru. This report reflects the observations and views of the consultant based on his assessment at the time.

s. 33(a)(iii)

The emergency capacity on Nauru relies on the interaction of both the contracted health provider, International Health Management Services (IHMS) and the Republic of Nauru (RON) hospital and is as strong as the weakest link.

While IHMS have good systems, personnel and equipment to care for staff, contractors, asylum seekers and refugees, their ability to deliver good emergency treatment is tightly linked to the performance of the hospital.

s. 33(a)(iii)

A great deal of improvement is potentially achievable through good leadership and implementing quality business and clinical processes.

Excellent work has been started in this area but will need support from all elements of Nauru's clinical and government community if it is to deliver its full potential.

s. 33(a)(iii)

## 1.Nauru emergency capability and capacity assessment 2016

## 1.1 Methodology

The methodology used to provide the assessment and observations in this report included:

- field visits;
- semi structured interviews;
- audits;
- triangulation and verification of key identified issues.

## **1.2 Consultation**

The following were interviewed in preparation of this report:

#### IHMS

- Senior Medical Officer
- Senior Nurse
- Health Services Manager
- MH Team Leader
- Paramedics x 3
- CEO

#### Australian Border Force

- Programme Coordinator s. 22(1)(a)(ii)
- Australian High Commissioner to Nauru
- Health Advisor, Australian High Commission
- PACTAM Advisor

#### **RON hospital**

- Medical Director
- Surgeons x 2
- ED doctors and staff
- Junior doctors
- Paediatrician
- Anaesthetist
- Obstetrics and Gynaecology Acting Director of Nursing
- Nursing staff
- Pathologist
- Biomed technician

## **1.3 Introduction**

s. 33(a)(iii)

. This report aims to consider both

the current emergency medical capacity and recommend strategies to improve that capacity. A whole of Nauru approach has been adopted in considering the issues of emergency management.

## 1.4 Background

s. 33(a)(iii)

#### s. 33(a)(iii)

Emergency medical care is provided by:

- the local hospital;
- a facility at the Regional Processing Centre (RPC) 1 site supporting outreach care at RPC II and RPC III;
- a settlement clinic adjacent to the hospital;
- mental health residential and respite services at RPC1 and mental health treatment in the community.

The IHMS system is dependent upon the hospital for definitive post emergency response care. Four ambulance vehicles service this community and are run by IHMS and the hospital.

Aspen, who is a fully equipped light surgical team, currently provides a surge capacity at the hospital on an ad hoc basis as required by the Department. Further back up is provided through offshore medical management, which comes at significant cost both financially and operationally.

## **1.5 Issues identified**

The IHMS medical facilities are well set up to provide emergency management to up to two patients at once but need definitive care from the hospital to continue the patient's care. The personnel are appropriately experienced and accredited. s. 33(a)(iii)

The IHMS system is well stocked and supported with X-rays, pathology and pharmacy, s. 33(a)(iii)

s. 33(a)(iii)

**Recommendation:** The emergency capacity on Nauru should be assessed evaluating the whole system, noting it is as strong as the weakest link.

#### The following recommendations relate to the RON hospital:

s. 33(a)(iii)

While it is not fair or appropriate to expect the standard of care typical of a tertiary Australian hospital, a level of care meeting a Pacific Island standard s. 33(a)(iii) s. 33(a)(iii)

s. 33(a)(iii)

A proactive approach to

maintenance and acquisition of spare parts is needed. s. 33(a)(iii)

**Recommendation:** That a proactive program of maintenance and equipment replacement be supported s. 33(a)(iii) .

**Recommendation:** That a sustainable biomedical maintenance program based on training a local technician under an existing technician be supported by the RON hospital.

Some pieces of equipment are needed to allow ED to function as an acute unit. These include:

- functioning defibrillators, including a high grade one capable of pacing capnography oxymetry and 12 lead (life pack 15?), supported by AEDs on the wards;
- patient monitors similar to those (Phillips) in HDU for the three resus bay beds;
- observation equipment;
- over way tables;
- record tables.

#### s. 33(a)(iii)

Strategies to manage wounds on the wards will also help awareness and early intervention in wound infection.

**Recommendation:** That the current infection control quality improvement measures continue and a monitoring system linked to a quality improvement process be introduced as the first of many quality improvement programs.

Staff morale and commitment to improvement have shown a dramatic improvement in the last few days however it will be important to maintain the momentum. A team consisting of a medical lead, nursing lead and systems/finance manager will be needed to maintain the standards.

**Recommendation:** That a team of medical, nursing and systems management experts is needed to maintain the momentum and if not available in house, they should be recruited.

s. 33(a)(iii)

#### s. 33(a)(iii)

#### Ambulance provision

The current arrangements have the most experienced crews and best equipped vehicles at RPC1 assigned to the care of staff, contractors, asylum seekers and refugees. s. 33(a)(iii)

**Recommendation:** That a strategic engagement of the experienced paramedics to be involved in revaluating the call taking, dispatch and response to ambulance calls.

## 1.6 Evaluation of current emergency response status

Capacity to provide care is a function of:

- Equipment
- s. 33(a)(iii)
- Personnel
- Culture
- Governance
- Back up

#### Equipment

Significant improvements with the release of stored equipment, however, still a few key pieces to find or acquire. An equipment maintenance and replacement process and personnel are required.

s. 33(a)(iii)

#### Personnel

The shortage of personnel, nursing, medical and management is still a key issue. Individual clinical personnel are clinically sound but hampered by the circumstances.

#### Culture

The new medical director has demonstrated leadership both by clearly articulating vision and by following through with actions. s. 33(a)(iii)

#### Governance

Governance in terms of quality, standardisation of process and strategic progress s. 33(a)(iii) and needs to be driven by all three members of the senior management team (nursing, medical and management).

#### Back up

Immediate backup on Nauru with support from IHMS and Aspen is available but needs to be strengthened by routine interaction. s. 33(a)(iii)

The opportunity exists to improve this process and thus improve emergency care.

## **1.7 Conclusions**

The emergency capacity on Nauru relies on the interaction of both IHMS and the RON hospital and is as strong as the weakest link.

While IHMS have good systems, personnel and equipment, their ability to deliver good treatment is tightly linked to the performance at the hospital.

s. 33(a)(iii)

Excellent work has been started in this area but will need support from all elements of Nauru's clinical and government community if it is to deliver its full potential.

## 2. Emergency risk assessment

There are a number of risks that may lead to a medical emergency on Nauru over and above those normally seen in a community of this size.

## Medical

s. 33(a)(iii)

• Infectious diseases including flu epidemics may place stress on the system. s. 33(a)(iii)

#### Surgical s. 33(a)(iii)

• The growing numbers of cars will predispose to vehicle accidents. Children playing near the road and motorcyclists without helmets are a particular concern.

## **Environment and major events**

- Fire is a significant risk with only two fire vehicles at the airport s. 33(a)(iii)
- s. 33(a)(iii)
- The possibility of a plane crash is particularly relevant given the dependence upon the single runway for further aid.
- Tsunami is mentioned in the hotel briefing but it should be noted that Nauru is surrounded by deep water making this unlikely to be significant.
- s. 33(a)(iii) IHMS have major incident plans and procedures that are well understood, s. 33(a)(iii)

## **3.IHMS emergency clinic**

- The emergency resuscitation bay at IHMS is well set up and well laid out with two duplicate bays fully equipped. All appropriate drugs and equipment were found.
- The emergency treatment posters are a mix of AHA and ARC (USA and Australia) and need updating to the latest versions.
- Monitoring is via life pack 15, infusion pumps are available, all basic resuscitation drugs are available and resuscitation is carried out in accordance with Australian standards guidelines. The treatment is in line with the Australian formulary.
- The pharmacy is extensive catering for emergency drugs with adequate stock numbers to allow continuous service. IHMS regularly assist the RON hospital when they have shortfalls in stock management.

- The paediatric trolley has a full range of appropriately sized equipment. Blood testing can be performed on site although the full blood count machine can be temperamental. X-rays can be performed on site.
- The major limitation of resuscitation at this site would be the lack of blood and inability to access theatre for major procedures/operations. It is best described as a well-equipped small emergency department with unfortunately no parent hospital behind it. Currently it is treating a large number of stakeholders.
- s. 33(a)(iii)
- The emergency department/resuscitation bay is staffed by paramedics, nurses and ED doctors.
- Record keeping and printing is an issue as the settlement clinic and RON hospital both work on a paper based system, whereas the main IHMS system is computerised.
- Records of transfers to the RON hospital are kept in the computer based record system.
- The facility is extensively used by stakeholders who can be managed overnight. Some nonasylum seekers and some stakeholders have to be sent to the hospital if admission is needed.

## 4. RPC II and III

Two centres exist in addition to RPC I:

- RPC II is a men's centre and contains 148 people many of which only use the centre for sleeping.
- RPC III contains 160 people and is a centre for families.

The accommodation is a mixture of Porta cabins with air conditioning, tents with air conditioning for those with children less than four years old and standard tents. They are supported with ablution blocks power etc.

A regular medicine round occurs using nurses who have adequate emergency equipment (Thomas pack) to support them in the event of an emergency. When the clinical staff are offsite security guards are trained in first aid and have a first aid kit however only one of the centres is equipped with an AED. Backup is via ambulance from RPC I, an estimated 10 minutes away. The call is made via radio and backed up by phone communication from Wilsons to IHMS.

## 5. Psychiatric services

- Mental health care in Nauru is very family centred s. 33(a)(iii)
- s. 33(a)(iii)
- The current model of mental healthcare being offered by IHMS is definitely an Australian model catering to large elements of the immigrant population.
- This model has succeeded in reducing acute crisis incidents from approximately 15 per week down to 2 per week. The model is delivered in conjunction with s. 33(a)(iii) services which started out providing purely social work and now offers counselling as well. This form of care is fairly labour-intensive however, relying upon caseworkers and daily contact to avert crisis situations.
- Psychiatric care to the Nauru population is provided by a dedicated psychiatrist, <sup>s. 22(1)(a)(ii)</sup> who provides Australian style psychiatry in the community. s. 33(a)(iii)
- As a strategy to reduce acute presentations this approach seems to be working however it comes at a significant logistic cost in terms of providing daily contact with caseworkers. A s. 33(a)(iii)

At RPC 1 there is a designated area of the centre for management of psychiatric patients which is envisaged to have five beds in one unit and two in another. These areas are in close proximity to the treatment centre and monitored by security who can call for assistance via

#### s. 33(a)(iii)

- However, the Department in conjunction with IHMS has undertaken extensive scoping work to upgrade the relevant area of the centre to create a safer and more therapeutic environment. Reconstruction work on this commenced in October 2016 and is due for completion in December 2016.
- Likewise, the Model of Care being introduced is clinician led, and will require clinicians to be on site to support safety and care for those residing at the facility rather than the security presence currently in place.

s. 33(a)(iii)

## 6. IHMS obstetric care

- Although it is not planned to deliver babies on site at RPC1 the capacity exists to respond to obstetric emergencies with syntocinon and misoprostol available plus a fully functional neonatal resuscitare at RPC 1 which is moved to the RON hospital for deliveries.
- An obstetrician/gynaecologist is available.
- There is only a limited blood supply at the RON hospital so this is supplemented with 6 units of O negative if a delivery is expected. A neonatal nurse has also been deployed to Nauru when a delivery is expected.
- The approach of a walking blood bank is not feasible for the immigrant population as they do not have large numbers of relatives to draw on and culturally may not accept it. s. 33(a)(iii)

This group of patients represent a potential risk that would have to be addressed with an • ambulance response and transfer with ongoing resuscitation in the event of a PPH or other obstetric emergency.

## 7. Settlement clinic

- There is a settlement clinic operating from portable facilities adjacent to the hospital. The clinic is operated by IHMS using up to 4 general practitioners and two nurses sourced from the Philippines and supervised by the senior IHMS doctor.
- The clinic is for refugees and is managed on an appointment basis with walk-ins in a similar manner to a general practice. The workload is approximately 36 patients per day (a viable workload for a single GP in Australia).
- The patients present as walk-ins at a rate of about 10 per day and about 5% of patients have • urgent issues which are referred to ED. There is a defibrillator and basic resuscitation equipment in the clinic.
- The clinic is supported by a general practice pharmacy but the model is that acute emergency medical care will be provided by the emergency department.
- A limited pharmacy is an advantage when working with GPs from other countries enforcing compliance with Australian prescribing practices.

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 Record keeping is maintained via paper records which creates an issue when sharing care with the RPC1 clinic.

#### s. 33(a)(iii)

• Apart from the obvious issue of relying on the emergency department there were no particular safety concerns with this clinic.

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s. 33(a)(iii)
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## 8. Emergency department at RON hospital

The current hospital emergency department is basic and the environment will be greatly improved by moving to the new department. There is a lack of good monitoring in the emergency resuscitation bays.

s. 33(a)(iii)



There is a partially stocked paediatric resuscitation trolley with appropriately sized equipment s. 33(a)(iii)



Oxygen is supplied from large freestanding s. 33(a)(iii) cylinders. s. 33(a)(iii)

Critical shortages of a number of basic disposable items are apparent including blood tubes etc. This could be addressed with the quality management program and ensuring that appropriate funds are available to purchase ahead of time.

The stock shortages are quite significant, the list today includes:

- needles size 19 and 21
- disposable gloves
- handed gel
- heplocks
- micropore
- lancets
- IV cannulas
- combine gauze
- facemasks
- surgical blades
- ceftriaxone
- syringes size 5 and 10 and 16 ml
- observation charts

In addition:

- There are no lumbar puncture needles with paediatric lumbar punctures being performed with a 21 gauge Green needle.
- There are no blunt tipped epidural needles increasing the risk of dural laceration.
- s. 33(a)(iii)
- There was a hyperbaric unit once however the chamber was defective and has been removed.

## 9. X-ray and imaging





- IHMS has a small portable X-ray unit capable of X-raying chests and peripheral limbs. The result of a chest and erect abdomen I saw were quite satisfactory. It is an electronic system producing a digital image.
- The hospital has a specific X-ray unit in a container, which provides an X-ray table and chest X-ray screen using a portable unit taking digital X-rays and then printing out hard copies afterwards. There are no reporting services, clinicians report their own X-rays. s. 33(a)(iii)

This unit is good for patients who are capable of walking and standing alone. There is an X-ray area in the new building due to be commissioned shortly. It is possible to use the X-ray unit as a portable unit and take X-rays in resuscitation. The quality of the X-ray is good.

- There is no capacity for X-rays in theatre to assist in orthopaedic management of fractures. Currently static X-rays are taken, the patient is transferred to theatre then orthopaedic management is conducted
  <sup>8,33(a)(iii)</sup>
- There are three well-equipped ultrasound machines available with appropriate probes.
  Fast scans are practicable providing the personnel are trained.
- There is a dedicated radiology technician who is responsible for ultrasounds, X-rays and CT scanning.
- CT scanning is controlled by IHMS, requiring hospital staff to liaise with them before booking a scan.
  - s. 33(a)(iii)

## 10. High dependency unit

There are two beds designated to high dependency at the hospital. These are equipped with modern emergency department level monitors.

The beds themselves are basic, however replacement beds have been located in storage and a decision has been made to use them.

There is no capacity to ventilate in this unit despite ICU ventilators being found in storage.

Currently there is little apart from the monitors to differentiate this room from any other room in the hospital.

## 11. Pathology services

- There is a good range of pathology equipment capable of producing results for full blood count and biochemistry.
- The haematology machine (Sysmex Kx-2IN) has been repaired however there are no standardisation solutions and therefore routine daily checks have not been performed. Because of this minor problem results cannot be issued and the routine haematology available is a haemoglobin check done on a Haemacue machine. Clinicians are currently running without the benefit of full blood count.
- The biochemistry section is capable of covering a wide range of biochemistry including blood gases however there are no blood gas syringes in the emergency department. Currently an ordinary syringe is heparinised in the old-fashioned way to achieve this end. Testing is performed through a series of strips and packs on automatic testing machines such as istat. This is a robust system and capable of supporting emergency diagnoses. It is important that sufficient funding is made available so that these tests are used widely.
- Thyroid function tests can be performed and run on a dedicated machine on a once a week basis. This machine is functioning and has all the necessary reagents.
- Microbiology, there is an appropriately set up facility with a brand-new hood for handling infectious specimens. From a microbiology point of view this is adequate resourcing providing the appropriately skilled laboratory technician is available.
- All the blood on Nauru including the blood relating to IHMS is stored at the hospital. There are two Blood Bank fridges, one is non-functional. This could be repaired easily with a replacement temperature monitoring system. The current small fridge is of limited capacity holding only about 20 units of assorted blood products. In reality a walking Blood Bank using relatives to donate blood is a functional practical alternative that is currently in use.
- It is strongly recommended that the second blood fridge is repaired as a matter of urgency not only increasing the amount of storage space but also offering redundancy in case of a fault in the one remaining fridge.

## 12. Obstetrics/Midwifery/Neonatal

- With one obstetrician only in the hospital there is value in using obstetric expertise from IHMS working in conjunction.
- The obstetrics side has already been reviewed however observations on neonatal resuscitation are relevant.
- There is only one working resuscitaire unit at the hospital that is not fully operational. At IHMS there is a fully operational unit.
- The hospital unit does not have the ability to control positive pressure ventilation with pressure regulation and is used only as a source of heat and oxygen supply for bag valve mask resuscitation.
- This unit has to be moved from the delivery suite to theatre each time there is a Caesarean.
- Although midwives are present there appears to be an absence of specifically trained and skilled neonatal nurses.

#### s. 33(a)(iii)

## 13. RON hospital staffing

Current medical staffing includes:

- General surgeon on contract
- Internal medicine locum
- Paediatrician locum
- Anaesthetist locum
- Obstetrics and gynaecology on contract
- Emergency physician on contract
- Psychiatry on contract
- Dentist on contract

s. 33(a)(iii)

Some observations are:

- These specialists are supported by five general medical officers on contract.
- Currently they are down on general medical officer numbers.
- There is no cover for the paediatrician or the internal medicine specialist.

#### s. 33(a)(iii)

- Recruitment seems to be mostly within the Pacific region the emergency physician comes from Fiji and the obstetrics and gynaecology consultant comes from Papua New Guinea.
- The Fiji medical education system seems to be favoured and appropriate.

Nursing staff:

- There has been a general shortage of nursing staff throughout the Pacific region. There are a number of nurses undertaking nurse practitioner training under the leadership of a nurse practitioner tutor.
- The Nauru health professional training institute coordinates enrolled nurse and nurse practitioner training.

## 14. Emergency capability benchmarks

With a population of 10,000 the health system would necessarily be small. Geographical isolation and some of the specific challenges in this mixed dynamic population warrant a higher level of care than would be found in a town of 10,000 in Australia.

s. 33(a)(iii)

## 15. Culture

An appropriate positive can do culture is essential for an effective healthcare system. s. 33(a)(iii)

s. 22(1)(a)(ii) is to be commended for identifying the need to provide positive clear leadership and acting to address some of these shortfalls.

Specific points that <sup>s. 22(1)(a)(ii)</sup> has made to the combined staff include:

- There is to be no differential care, s. 33(a)(iii)
- He wishes to establish a culture of quality care in the hospital.
- He wishes collegial care between the different health care providers with no territorialism.
- He wishes a logical approach to the rapidly expanding numbers of overseas referrals.

s. 33(a)(iii)

#### s. 33(a)(iii)

Infection control training is compulsory and anyone not complying with it will be unemployable. This strong stance is to be commended.

As individuals, all of the medical and nursing staff interviewed acknowledges a frustration with the level of planning in terms of staffing planning and equipment and consumable planning. With the right support and right leadership a positive outcome is highly likely.

Investment in supporting strong leadership with quality assurance and planning functions in line with good business practice will deliver more clinical benefit than donations of specific highly expensive pieces of equipment without the consumable budget, maintenance plan, and all staff training to support them.

Evidence of a staff recognition program was found, however it appears to have been abandoned.

s. 33(a)(iii)

Once a medical decision to evacuate an emergency patient has occurred the administrative processes should facilitate the movement without delaying activation. Because the logistics of evacuation are complex there will be many opportunities to override the medical call for evacuation while the process is commencing. If overriding reasons why an evacuation should not continue are identified a mission can be turned back before it takes off. Knowing that a reversal is possible at almost any stage of a mission allows parallel processing to occur without any delay in the commissioning of a mission.

Rapid access to back up and evacuation greatly enhances emergency capacity and therefore paradoxically reduces the actual number of evacuations. Knowing that an emergency evacuation is a practical backup, physicians are more likely to attempt to manage a situation locally. On the other hand, knowing that it may take a long time to achieve an evacuation is going to drive a culture of calling early and often.

Knowing that an emergency evacuation can be rapidly accessed enhances the capacity/confidence of physicians to take a decision to attempt management on Nauru and thus will reduce the number of requests for evacuation.

s. 33(a)(iii)

s. 33(a)(iii)

## 17. New hospital development

The building works for a new emergency department and resuscitation bay are completed however minor adjustment needs to be done to allow direct ambulance unloading through the wall next to the ambulance bay.

The rest of the building works appear to be very nearly ready to move in and will provide a more than adequate environment to assess and resuscitate emergencies.

Two new theatres with appropriate anaesthetic rooms etc. are ready to be used in the near future. An issue with the gas supply was traced to external tampering outside the building. A final commissioning check is needed and apart from that the intention is to move in once various procedural issues have been sorted out in the existing facilities.

The CT scanner appeared to be functional although the building works are still continuing around it.

A certain amount of the equipment is tied up in the building works, for example sheets and ventilators. s. 47C(1)

## 18. Ambulance services

There are four ambulance vehicles on Nauru. Two situated at the RPC Clinic operated by IHMS and two by the hospital.

The 2 IHMS vehicles are troop carriers and appropriate to rough terrain. Radio contact is via small handheld radios. There are a few identified black spots.

The paramedics respond solo but are of intensive care paramedic plus extra experience standard. There are four on the roster, and two are present at any time on Nauru. Vehicles are dispatched as single response units (one paramedic only).

The majority of responses are low priority, over the last few years there have been 2 STEMI, 2 Non STEMI, 1 Anaphylaxis and 2 major burns.

The primary ambulance is fully equipped with monitor etc., while the secondary ambulance has a more basic configuration lacking the monitor. As with any troop carrier ambulance room is limited in terms of treatment in transit. However with only 21 km of bitumen there is not a great deal of time for treatment in transit.



At the hospital the primary ambulance is a full traditional ambulance with box module. It is obviously ex-Australian with all the equipment stripped out there are two fishing tackle boxes with basic airway IV etc. in them. There are no drugs, monitor, splints, backboard, etc. This vehicle has a kill switch on the front bumper, which renders it inoperable when closed, an issue that almost caused it to be condemned before it had been used. The second vehicle is the troop carrier which is equipped with the basic stretcher, oxygen and a limited amount of equipment as above.





The ambulance is crewed by a driver. There is not a spare nurse to accompany him. The driver has no specific training.

Dispatch is via phone call to the emergency department, which then triggers a series of phone calls to find the driver and send him to the destination. s. 33(a)(iii)

## Appendix A

## Safe emergency capacity

#### Background

Because of the interdependence of IHMS and the RON hospital in the provision of emergency care the overall ability to manage an emergency is only as strong as the weakest link.

In order to manage an emergency, for example:

- acute coronary syndrome,
- acute asthma,
- hypovolaemic shock, or
- major trauma

A level of personnel, equipment and consumables is necessary.

Shortfalls in some consumables in the hospital can be supplemented from IHMS as can shortfalls in personnel, providing they are available on Nauru.

The critical points include shortages of blood, a shortage of an emergency physician, an anaesthetist and an appropriate surgeon. Obviously for paediatric and obstetric cases this includes the obstetrician and the paediatrician.

Should the hospital and IHMS combined not be able to provide the appropriate range of specialists and consumables these will need to be supplemented to ensure safe treatment of all patients, including Australian Government employees.

The key personnel include:

- General surgeon
- Internal medicine
- Paediatrician
- Anaesthetist
- Obstetrics and gynaecology
- Emergency physician
- Psychiatry

These should be available and appropriately credentialed to manage a range of emergency medicine and acute trauma/surgery presentations.

They should be supported with appropriate nursing staff.

The combined staff should have access to a full range of investigations and consumables including drugs appropriate to emergency medicine and blood (at least six units of O negative). Functional emergency equipment including monitoring and defibrillation equipment is of course essential. Equipment should be appropriately maintained with routine quality control checks and standards met to ensure reliable functionality in an emergency.

An inability to adequately cover these personnel and equipment will render Nauru effectively impaired in its ability to manage an emergency which could include a stakeholder, a member of the Nauru public or an asylum seeker/refugee.

In the event of significant shortfall in this capacity list while a need for emergency response is present, it is recommended that assistance be provided to the medical director of the RON hospital to ensure that appropriately qualified and credentialed personnel who are appropriately supported are present.

## Assessment of Emergency Medical Capability and Capacity PNG 2016

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## **Executive summary**

s. 22(1)(a)(ii) was engaged by the Department of Immigration and Border Protection (the Department) to provide an overview of current capacity and capability of health services contracted by the Department as well as local services available to respond to a health emergency on Manus Island and in Port Moresby.

This report reflects the observations and views of s. 22(1)(a)(ii) based on his assessment at the time.

An assessment of emergency capacity relating to the care of staff, transferees, refugees and other stakeholders was carried out by visual inspection and interview.

Sites and elements assessed included:

- the medical clinic at the Regional Processing Centre (RPC) on Manus managed by the Department's contracted health services provider, International Health and Medical Services (IHMS);
- the public hospital at Lorengau including issues pertaining to accessibility;
- the privately run Pacific International Hospital (PIH);
- Port Moresby General Hospital; and
- the IHMS-run community support team based at the Granville Hotel, Port Moresby.

An assessment of the capacity of the system as a whole, as well as individual elements, was considered. Strategies to manage cases in time of normal demand and surge demand were also considered.

## **1.Terms of reference**

## 1.1 Methodology

The methodology used to undertake assessment and observations in this report included:

- field visits;
- semi structured interviews;
- audits; and
- triangulation and verification of key identified issues.

## 1.2 Consultation

The following personnel were interviewed in preparation of this report:

#### IHMS:

- Senior Medical Officer
- Senior Nurse
- Health Services Manager
- MH Team Leader

#### Australian Border Force:

• Programme Coordinator

#### Lorengau public hospital:

Medical Director

#### PIH:

Medical Director

#### Port Moresby General Hospital:

• CEO

## 2. Recommendations for Port Moresby

Port Moresby is well placed to receive cases from both Manus Island and Nauru. Port Moresby is about two hour's transit time from Manus Island airport and just four hours from Nauru. There are two hospitals in Port Moresby, a private hospital (PIH) and a public general hospital both situated 16 minutes' drive from the airport.

The general hospital is busy, with 1000 presentations to the Emergency Department (ED) a day and s. 33(a)(iii) The hospital is clean and has made significant improvements over the last five years. s. 33(a)(III)

#### **Recommendation:**

That a surge capacity/ mass casualty response plan involving the whole system needs to be formulated, documented and widely understood.

The PIH is a private hospital staffed with specialist staff, many of whom trained in India, United States of America (USA) and Australia. They are supported by junior staff and work in a well-equipped modern hospital. While not all specialties are catered for, there is a group of specialists registered in Papua New Guinea (PNG) who reside in India who could be called on at short notice. The range of facilities available includes Computed Tomography (CT) scan, Magnetic Resonance Imaging (MRI), Catheterization Laboratory, echocardiography and dialysis. A well-equipped ED is supported by theatres and a high dependency unit with ventilator capacity that has the potential to meet the expectations of a tertiary ICU when an Internist who has been recruited arrives.

This facility is supported with pathology services and a blood bank. The Australian Federal Police (AFP) has a separate blood bank with only three units at this site. Staff are well trained but lack the opportunity to keep up to date with current trends.

#### **Recommendations:**

PIH represents an appropriate venue to manage staff, transferees, refugees and other stakeholders, which could be enhanced with the involvement of staff from Australia in the team.

There is a possibility that identified Australian specialists could be pre-registered as PIH affiliates in a similar model to that used for the existing external specialist pool.

s. 33(a)(iii)

PIH hospital would make an appropriate place for mounting a surge capacity response.

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## 4. Recommendations for medical referrals to Port Moresby

Staff, transferees, refugees and other stakeholders who are referred to Port Moresby for treatment and assessment are supported by a community team, which consists of nursing clinicians. This team is operating without immediate back up and without appropriate first response equipment.

#### **Recommendations:**

The clinical governance of this team should be reviewed and documented.

A first response kit should be provided.

#### s. 33(a)(iii)

This group requires clinical support from a GP and admin support to manage the administrative tasks.

Consideration to a written briefing process covering the expectations of staff, transferees, refugees and other stakeholders undergoing treatment is recommended.

## 5. Port Moresby General Hospital assessment

Port Moresby General Hospital serves not only the population of Port Moresby but also to referrals from the whole country. There are approximately 1000 ED presentations per day. Patients presenting are triaged according to the Australian five point triage system with only Triage 1 and 2 entering the main ED. Triage 3, 4 and 5 are dealt with in a different clinic.

The ED has 28 beds and like Australian hospitals suffers from bed block. There are 10 direct admission beds for medical and 10 direct admission beds for surgery to alleviate workflow issues.

X-rays are available via an electronic system; s. 33(a)(iii)

The ED has three beds that are deemed resuscitation; these beds have monitors and there is a monitor/defibrillator and an ox log ventilator in this area and a drug trolley containing modern drugs. s. 33(a)(iii) There is a store of equipment in ED, which contains 22 infusion pumps and two Electrocardiography (ECG) machines as

well as non-invasive blood pressure monitors and two pulse oximeters.



(ED store)

The lead ED doctor has fellowship qualifications, as does the lead ICU doctor. There is a Vascular Surgeon who is USA trained on staff.

The workload consists of a significant number of trauma victims, infections including Tuberculosis (TB) and snakebite victims who arrive from rural areas. s. 33(a)(iii) Cardiothoracic Surgery and Cardiology services are offered and Cardiac Pacing (pacing) is offered. Surgical management tends to be by open surgery s. 33(a)(iii)

installed s. 33(a)(iii)

There is a CT scanner and an MRI

The hospital has seven ICU beds s. 33(a)(iii) there are three coronary care beds and a high dependency step-down unit with 30 beds. ICU contains seven beds and all are equipped with ventilators s. 33(a)(iii)

Central venous pressure monitoring occurs via traditional manometer techniques. The choice of inotrope is dopamine. There appears to be a good selection of standard drugs. There is a defibrillator located in ICU with a life pack of 15. s. 33(a)(iii)

it is a clean efficient environment. This is a huge step forward from the situation that apparently existed five years ago where there was only one ventilator. s. 33(a)(iii)

Overall the hospital is clean and effective working with large demands and a relatively modest budget. Unfortunately projected financial cuts to this budget and the subsequent loss of the CEO raises doubts as to whether these improved standards will be maintained.

s. 33(a)(iii)

## 6.Pacific International Hospital (PIH), Port Moresby assessment

The PIH provides a range of private medical services in Port Moresby. The hospital group is expanding with the acquisition of another hospital in Lae and further beds to be added to the existing hospital.



(sprinter ambulance equipped with MRX)

The emergency response/capability of PIH was assessed by visual inspection and discussion. The hospital is situated some 16 minutes from the airport and possesses two ambulances, which are used to retrieve patients. These ambulances are equipped with an MRX monitor defibrillator, suction oxygen etc. The drug resources within the ambulance are somewhat limited but it is understood that drug packs will be taken from the hospital for a patient retrieval. The vehicle is crewed by a driver, paramedic, nurse and doctor depending on the nature of the patient's condition.

The vehicles are Mercedes sprinters sourced from Victoria and still configured for paramedic use s. 33(a)(iii)

Patients are sometimes bought directly to the hospital via other providers and handovers are adequate, however a local private EMS provider was quoted as needing development in this area.



#### (resuscitation bay)

The ED has two resuscitation beds, one procedure room and four other beds with the capacity to expand into a neighbouring room.

The department is staffed by dedicated nursing and medical staff. Mobile X-rays are possible in the department.

Triage occurs, which allows preferential treatment of the sickest. The resuscitation bay is well stocked and supported with appropriate emergency department monitors as are the other beds. There are two oxylog ventilators and drugs available for a rapid sequence induction. Airway equipment included nasopharyngeal and laryngeal mask airways as well as Endotracheal Tube (ET) tubes. There was a full range of functioning self-inflating bags for ventilation support. Pulse oximetry was readily available and both venous and arterial blood gases were available. A full range of equipment supports chest drain insertion. IV access utilises a full range of cannula, there was an absence of a rapid expander kit or an intraosseous insertion kit.

Drugs are available in the resuscitation trolley and included:

- Adrenaline
- Atropine
- Amiodarone
- Pheniramine maleate
- Frusemide
- Dexamethasone
- Adenosine
- Potassium chloride
- Calcium gluconate
- Sodium bicarbonate
- Lignocaine
- Hydrocortisone
- Propofol
- Suxamethonium

These represent an appropriate emergency resuscitation drug list.

Resuscitation is guided by AHA resuscitation guidelines. There are three Anaesthetists available to support resuscitations. The staff reported successful resuscitation of trauma patients, one with a vascular injury to the neck and an intra-abdominal injury.

The ICU is of moderate size with one single isolation room, this is not pressurised either negatively or positively. At the time of inspection there were only two patients in the ICU. Currently the clinical management of a patient in this unit is under the direction of the treating clinician with support from the Anaesthetist to assist with ventilation. An Intensivist has been engaged and is due to commence

at the hospital shortly. In the current situation this unit would be classified as a high dependency unit in Australia, and it has the ability to expand capacity following the arrival of an Intensivist. The equipment includes monitors and ventilators appropriate to adult HDU/ICU.

## Surgery

There is surgical capacity with regard to equipment in order to perform a wide range of surgery including neurosurgery; however there is not currently a clinical neurosurgeon. The Neurosurgical equipment is sufficient to allow craniotomy and definitive neurosurgery. General surgery and Orthopaedics appear to be facilitated with the capacity to manage major fractures and external fixation of a fractured pelvis. There are a number of Indian specialists who have been cleared and registered allowing rapid entry should their sub specialty services be needed.

## Gastrointestinal bleeding (GI bleed)

There is capacity to undertake gastroscopy procedures and to undertake interventional control of upper GI haemorrhage.

## Cardiac

Cardiac care is supported by monitored beds, and there is capacity to provide thrombolysis using streptokinase, high sensitivity troponin testing, as well as performing elective angiograms and angioplasty, and cardiac echoes and stress tests. There are plans to perform hot cardiac angioplasties in the near future.

## Obstetric



(neonatal resus units)

There are adequately equipped birthing suites and neonatal resuscitation facilities staffed by nurses who demonstrate an understanding of neonatal resuscitations. There is a functioning neonatal resuscitation unit suitable for standard neonatal resuscitation of term deliveries.

## Dialysis

There is capacity to facilitate three dialysis patients simultaneously with one unit identified for hepatitis positive patients. Currently there is no vascular surgery capability to maintain and create Arteriovenous Fistula, which is managed through the general Hospital.

## Pathology

A full range of standard blood tests is immediately available and the equipment is maintained by two dedicated biomechanical engineers who are employed full-time. Cardiac troponin testing uses high sensitivity troponin tests backed up by an ISTAT unit.

### **Blood bank**

Elective surgery transfusions are managed by blood donation from family members with a two bay blood donation suite. Blood screening for hepatitis and HIV is undertaken, due to the high levels of HIV within the population. There is an adequate blood fridge with space for 80 units and a centrifuge for separating blood products. s. 33(a)(iii)



(AFP blood fridge)

(main blood fridge)

## Radiology and imaging

There is an MRI scanner and two CT scanners on site which are supported with an uninterrupted power source capable of maintaining scanning for 25 minutes to allow the completion of an examination. Two Radiologists are on staff to read the scans. X-rays and ultrasounds are available in two units. Currently interventional radiology is not offered however, one of the Radiologists has experience in this field.

### **Isolation rooms**

There are two isolation rooms with air locks that are appropriate for managing highly infected patients in the facility.

### **Reserve capacity**

In addition to the existing staff, the CEO has a number of Indian specialists preregistered and is able to commence work at short notice. In many respects this hospital resembles a well-equipped rural base hospital in Australia.

## 7.IHMS facilities at the RPC assessment

The IHMS facilities were inspected and capacity assessed by visual inspection and discussions were undertaken with staff.

## Ambulances

Two vehicles exist, a troop carrier and an ex-Queensland ambulance, s. 33(a)(iii)

The troop carrier was equipped with a monitor defibrillator, suction, prehospital care and equipment appropriate to respond to a case. Drugs are kept in the facility because of heat issues in the vehicles. These may be loaded prior to dispatch.





(well-equipped troop carrier ambulance)



#### (ex-Queensland ambulance s. 33(a)(iii)

s. 33(a)(iii)

s. 33(a)(iii)

Currently there are fire trained individuals who would have the expertise to run some extrication equipment, possibly rams and cutters which do not have to be heavy duty as there are relatively few heavy vehicles on the island.

## **Emergency resuscitation bays**



(resuscitation bays)

Two identical resuscitation bays equipped with monitor defibrillators, oxylog ventilators and resuscitation trolleys exist. Very few patients require intubation and ventilation however this may be undertaken safely in this environment. Drugs and equipment in the resuscitation trolleys were appropriate. There are a further two monitored beds in the department allowing management of four critical patients at once.

## Theatre

There is a fully equipped theatre, which is currently not operational s. 33(a)(iii)

. Supporting theatre is a recovery bay with space for two patients. Oxygen is piped to the theatre and the recovery area but the ED runs on cylinders. There is a functioning steriliser, which is used.

## Ward

There is an effective fully equipped six-bed ward, which is not licensed to be used as a ward but is suitable for inpatient management with individual rooms and en suite, etc. This could be utilised if required.

## Isolation/containment unit

There is a four-bed isolation/containment unit, which might be used for patients requiring isolation as part of management s. 33(a)(iii)

## Behavioural disturbance/mental health emergency

s. 33(a)(iii)

dedicated to providing voluntary respite to patients s. 33(a)(III)

There is an area

## Pharmacy

There appears to be a reasonable range of pharmacy available including antibiotics for resistant organisms, such as vancomycin. s. 33(a)(iii)

R

s. 33(a)(iii)

#### **Dental emergencies**

A dentist visits on a regular basis staying for a week at a time and manages dental emergencies if required.

### Eye emergencies

There is a slit lamp available for eye examination.

## Radiology

Portable X-rays can be taken and are digitally reported at North Shore. The X-ray unit lacks flexibility but is capable of X-raying even large abdomens. There is no facility to undertaken contrast studies.

## Ultrasound

There is a portable ultrasound machine available for use.

## Pathology

A wide range of pathology tests may be performed using ISTAT machines as well as a number of care testing machines. Os. 33(a)(iii)

Biochemistry, full blood count, troponin and gases are all available for testing. Malaria testing has presented positives, including staff despite antimalarial education. Vector control around the site appears to be effective. Further pathology for detailed tests may be arranged by sending samples to Australia with results being available in a couple of days.

### Blood

There is a fully functional large blood fridge s. 33(a)(iii)

## **Medical evacuation**

s. 33(a)(iii)

#### Mass casualty

There are pre-boxed stores ready to respond to a mass casualty and a large amount of burn gel available. There are also empty boxes into which equipment may be loaded should the facility need to be evacuated. This has occurred once in response to a tsunami warning.

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## 11. Education session at PIH

An education session focusing on recent/current discussions in emergency care was arranged for Friday morning (4 November 2016). The session was facilitate for over an hour with good interaction and questions and was attended by 24 participants including the Chief of Surgery, Anaesthetists and ICU and ED staff.

Topics discussed included:

- Chest trauma
- Pneumothorax, needle vs. finger thoracotomy
- Tamponade management
- Intra-abdominal haemorrhage
- Minimal vol resus
- Vascular access expanders and IO
- Massive transfusion
- Damage control surgery
- Temperature control in trauma
- Anaphylaxis management
- Management of rapid AF
- APO management.
- CCF and COAD management
- Tranexaemic acid and factor VII

Much of the direction of the session was determined by the participants' interest and questions.

Suggestions from participants included:

- The need for courses in ALS EMST etc., which could be facilitated in PIH with a mixed faculty.
- The possibility of exchange with Australian specialists.
- Possibility of PIH teams operating at the RPC if the theatre was operational.

All these suggestions are worthy of further consideration.

## 12. Contingency planning

s. 33(a)(iii)

## 13. General strategy

Preparations to be undertaken where a surge/major incident/disaster response plan is needed which covers:

- transport of large numbers of personnel and patients
- pre-positioning of personnel and transport platforms
- pre-registration and authorisation of clinical rights to practice for designated personnel
- identification of a responding agency and governance structure

In order to ensure smooth local relations, the involvement of a local provider (PIH) as a partner in a joint response would be prudent.

Key identified medical personnel in Australia/overseas should be pre-registered by PIH as associate members of that organisation, and could then be deployed as part of a mixed team.

Deployment arrangements including employment contract, insurance, and response times need to be negotiated with these key personnel ahead of time.

A DIBP team leader/liaison coordinator should be identified to be deployed at the time of a surge capacity.

Australian/overseas personnel could be based at PIH to work with PIH staff to provide Australian tertiary standard medical care in country in normal load situations. The secondment of Australian personnel to PIH not only ensures Australian tertiary standard and modern care but also offers PIH staff an opportunity to up skill.

A surge response would commence with placing these additional staff at PIH.

If the theatre and wards have been opened, routine lists by the visiting teams of mixed personnel under a PIH banner could provide care on-site.

In a surge situation, mixed teams under a PIH/DIBP banner could be deployed to commence resuscitation and damage control surgery on site.

s. 33(a)(iii)

Transport arrangements need to be pre-planned with retrieval aircraft pre-positioned at Port Moresby with crew and flight plans for rapid take off to meet a patient/s at the Manus airport.

Mass transport could either be via a military plane or a chartered civilian plane.

If chartering a civilian plane, seats will need to be removed and secure tie down points installed to accommodate stretcher cases. If pre-planned, this could be achieved in a matter of a couple of hours; seats mounted on aircraft tracks and can be removed quite quickly and cargos tie down points linked to the same tracks. Adequate numbers of stretchers need to be sourced from possibly the military.

## 14. Summary escalation strategy

## **Business as usual**

• external experts providing definitive care at PIH and building relationships with PIH

## Level one surge (increased activity or possible concern of activity)

• pre-position external experts at PIH, pre-[position retrieval aircraft at Port Moresby, check and enhance levels of consumables and blood at RPC

## Level two surge (significantly increase numbers of illness or trauma presenting at RPC)

- move up surge team focusing on either stabilisation and retrieval or damage control surgery if theatre is open to RPC
- ensure PIH fully staffed to deliver tertiary level care
- pre-position DIBP team leader/liaison role in PIH
- ensure Community Support Team adequately staffed and supported to deal with extra load
- bronze commander, RPC team leader
- silver commander, DIBP team leader at PIH
- gold commander, Chief medical Officer in Australia

## Mass casualty/disaster

- consider extra planes/a large plane
- consider extra teams and resources
- consider extra resources for Port Moresby Community Support Team
- ensure staff safety and security of patients and staff, liaising with Port Moresby police/military