Mongolia is a landlocked country bordering China in the south, Russia in the north and a very short border in the west with Kazakhstan. The land area is equivalent in size to Alaska and the country has one of the lowest population densities in the world. The population of Mongolia is 2.8 million with nearly half living in its capital city Ulaanbaatar (UB). Outside of the capital, the country is divided into twenty-one provinces (aimags), which are in turn divided into districts (sums). About half the population live in relatively urbanised environments whilst the other half live in small communities in traditional Gers, of which, half are considered truly nomadic, moving around the countryside up to four times a year. Mongolia has a continental climate characterised by very low rainfalls and wide temperature variations ranging from -60°C in winter to +45°C in summer.

Mongolia’s history and economy
Mongolia’s greatest hero, Chinggis (Genghis) Khan, conquered a huge Eurasian empire in the 13th century. The country came under Chinese rule in the 17th century and only achieved independence in 1921 with Soviet support. A Communist regime was installed in 1924 and the Mongolian People’s Republic was declared. After the breakdown of communist rule in 1989, Mongolia saw its own democratic revolution and the development of a new constitution in 1992.

Mongolia’s economy is centred on agriculture and mining. It has extensive mineral deposits of copper, coal and tin. About one fifth of the country's population live on less than US$1.25 per day.

The capital, UB, is growing faster than the city’s infrastructure can support. More people move into urbanised areas each day and are now forming ‘Ger districts’ on the fringe of the city where traditional Gers are put on a small plot of land without sanitation or running water (Figure 1).

![Figure 1. Outside and inside a traditional Mongolian Ger.](image)

The healthcare system
Mongolia had no medical system until the 1920’s when the Russians set up a system based on their socialist models. The health system remains that of a developing country and is primarily hospital based. Some healthcare statistics
provided by the World Health Organisation (WHO), compared with UK data, are shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Mongolia</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>% GDP spent on health</td>
<td>6.3%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Overall life expectancy</td>
<td>69 years</td>
<td>81 years</td>
</tr>
<tr>
<td>Infant mortality (deaths/1000)</td>
<td>34.78</td>
<td>4.5</td>
</tr>
<tr>
<td>Number of doctors per 10,000 population</td>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>Hospital beds per 10,000 population</td>
<td>61</td>
<td>39</td>
</tr>
</tbody>
</table>

Table 1. Health care spending and life expectancy data per country by the World Health Organisation.

The Australian-Mongolian medical project
A group of multidisciplinary health professionals including anaesthetists, emergency physicians, surgeons, obstetricians, gynaecologists and midwives have volunteered to support a medical education program in Mongolia since 2001. The project includes annual seminars, hospital visits and in theatre teaching. The anaesthetic team have also helped develop a new training program for the Mongolian Society of Anesthesiologists (MSA).

The project has been supported by the not-for-profit Australian organisation Interplast who joined us this year to evaluate the on-going need for support.

Anaesthetics in Mongolia
Prior to the development of training through the Australian-Mongolian medical project, anaesthetic training consisted of just six months of anaesthetic experience after a basic five year medical degree. This meant these trainees had experience of maybe only twenty general anaesthetics before being able to work independently and train new anaesthetists. There was very little continued learning in part due to the vast distances between healthcare facilities in the country and the great demand on clinical work. Anaesthetists had many ill-conceived ideas such as thinking patients under general anaesthesia did not need analgesia and not reversing muscle paralysis. The trust of the local anaesthetists has slowly been won and they are now starting to adopt modern anaesthetic practices.

The anaesthetic training program has been developed by Assoc. Prof David Pescod with assistance from the Australian Society of Anaesthetists (ASA) and Interplast. Residents are supported during the two-year modular based program with a core text book, additional computerised resources and an annual post-graduate seminar. They rotate through the various sub-specialties during placements in the city hospitals such as eight weeks of paediatrics. Anaesthetic services provided in the capital support most surgical specialties.

Those anaesthetists who work in the countryside have limited resources. Many do not have access to essential basic airway equipment such as a bougie or laryngeal mask airway.
The 2014 Australian-Mongolian medical project

The anaesthetic team for 2014 included:

Dr Amanda Baric
Assoc. Prof. David Pescod
Prof. Roger Goucke
Dr Phil Popham
Dr Nam Le
Dr Patricia Goonetilleke

Dr Stefan Sebato
Dr Anna Negus
Dr Roger Goucke
Dr Anna Pederson
Dr Siân Griffiths
Dr Yayoi Ohashi
Dr Alison Jarman

There was also a separate team providing teaching on Initial Emergency Care supporting emergency medicine training in Mongolia.

This was the second year I joined the team to deliver teaching in Mongolia. This year, I was supported by a travel grant awarded by the AAGBI.

The anaesthetic team provided training in the following areas over 10-14 days:

Annual seminar – paediatric anaesthesia

The two-day annual seminar, hosted by the paediatric department at the Mothers and Children’s Research Hospital (MCH), provided lectures and workshops to about eighty participants (doctors and nurses) from all over Mongolia. The first day was aimed at teaching resuscitation and management of the critically unwell child. We included sessions on paediatric advanced life support, newborn resuscitation, choking, burns, shock and fluid management. The second day focused on paediatric anaesthetic related topics such as the difficult airway, pain management, regional anaesthesia and recovery problems. Sessions were run by the visiting faculty and Mongolian paediatric anaesthetic specialists (Figure 2).

A pre- and post-seminar quiz demonstrated learning from the two-day program and an accompanying manual written by the visiting faculty was distributed. Delegates were also given further reading material from the MSA that included a
copy of the annual Mongolian Journal of Anaesthesia, the most recent edition of Update in Anaesthesia, and an updated version of the translated core anaesthetic textbook written by Assoc. Prof. David Pescod (Figure 3).

Figure 3. Educational material distributed to delegates by the President of the Mongolian Society of Anaesthesiologists Dr Unurzaya Lhagvajav.

**Essential Pain Management (EPM)**
The three-day course was run at the Military and Trauma Hospitals (Figure 3). Delegates were taught the basics of acute pain management and asked to volunteer for the instructor course the following day to learn to teach the course in their own hospitals. The newly trained Mongolian instructors were supported running their own course on the final day.

Figure 3. Faculty, including course organiser Prof. Roger Goucke, and participants of the EPM course at the Military Hospital.
Laparoscopic gynaecology surgery
A team of gynaecologists from Australia have been training Mongolian gynaecologists in laparoscopic techniques since 2009. They have been joined by an anaesthetic team teaching the anaesthetists safe general anaesthesia for laparoscopic surgery. I joined the team last year in UB and Ulaangom, in the countryside. This year the team returned to the countryside to build on last year’s experience and I joined the team when they returned to UB to promote the surgical safety checklist in theatre (Figure 4).

Figure 4. Nursing staff using the surgical safety checklist at First Maternity Hospital, UB.

Ultrasound guided regional anaesthesia
Some Mongolian anaesthetists have access to an ultrasound machine and they were keen to learn ultrasound guided nerve blocks. A one-day hands-on workshop was delivered to a small group of local anaesthetists (Figure 5). They have requested further teaching and acquisition of more ultrasound machines.

Figure 5. Workshop delivering ultrasound training in regional anaesthesia.
Newborn resuscitation & infection control
I supported another member of our team, Rhonda Keenan, a midwife educator, to run a newborn resuscitation training session at First Maternity Hospital. An additional session by Dr Nam Le highlighted the importance of infection control procedures and demonstrated good hand hygiene (Figure 6). This was a particularly important topic to cover as many of the maternity hospitals in Mongolia have high rates of maternal deaths secondary to sepsis.

Global oximetry & the WHO surgical safety checklist
A half-day training session was allocated to promoting the use of pulse oximetry and the WHO surgical safety checklist (SSC). Fifteen LifeBox oximeters were donated by the ASA and the Australian and New Zealand College of Anaesthetists to the paediatric hospital in UB (MCH). Staff, including anaesthetists, theatre and recovery nurses received training in the use of the LifeBox pulse oximeter, Figure 7.

Figure 6. Demonstration of the five steps of good hand hygiene.

Figure 7. Staff receiving training in the use of the LifeBox pulse oximeter.
A translated version of the SSC was introduced by the Department of Health in Mongolia in 2013 (Figure 8). The importance of the SSC was emphasised at the meeting and I promoted its use when in theatre at First Maternity and MCH. Its use appears to be inconsistent although staff were aware and willing to complete the form when encouraged. The benefits of the SSC were further highlighted during a presentation at the MSA annual seminar to anaesthetic delegates from all over Mongolia (Figure 9).

Figure 8. The surgical safety checklist used in Mongolia.

Figure 9. Promoting the use of the WHO Surgical Safety checklist at the annual seminar.
The future
A representative from Interplast met with members of the MSA to ascertain their sustainability. The MSA is run voluntarily by incredibly dedicated members who are fully committed to the development of the organisation and its long-term vision. They are financially supported by external funding but are looking at ways to become financially independent.

The MSA continues to need support to develop anaesthetic services in the countryside where resources remain very limited. The organisation is keen to develop a specialty training program for emergency care providers similar to that developed for anaesthetic trainees. The EPM course will continue to run with minimal external support as there appear to be sufficient numbers of trained instructors in order to provide independent training.

The MSA are keen to expand the use of ultrasound in anaesthesia. Next year's seminar will cover anaesthesia for patients with co-existing disease.

I would like to thank the AAGBI for supporting my contribution to this project, and my colleagues from Australia and New Zealand whose hard work, enthusiasm and commitment has made this a successful project.

Dr Siân Griffiths
Anaesthetic Fellow, London