I am David Neynens, a Trainee Intern based in Invercargill. I had the good fortune of being selected for a Scholarship from the Pat Farry Trust. This allowed me to travel to my two elective destinations: Manali in Northern India and Gibraltar. During my elective I hoped to gain some insights into various methods by which healthcare is provided to those in rural areas.

India

India Background

India is an expansive country in the Asian sub-continent with climates varying from the tropical jungles in the south to deserts and mountainous areas in the north. It is the second most populous nation in the world and at the current rate of growth it may become more populous than China in the next thirty years. Despite being known for overcrowded metropolises such as Mumbai and Delhi, approximately over two-thirds of India lives in rural areas, compared to one-seventh of New Zealanders.[1]

Despite having one of the world's largest economies, India's GDP per capita is relatively low, with an estimated GDP per capita of 4000 USD (compared to 30, 400 in New Zealand). The GDP per capita may also be skewed upwards by extremely rich outliers.[2]

Himachal Pradesh

Himachal Pradesh is a small mountainous state in the north of India. It accounts for less than 0.5% of India's total population and has little impact on Indian politics. A benefit of this is corruption levels amongst the lowest of all Indian states.[3]

Its economy is based on agriculture and horticulture, with the majority of the State GDP obtained through fruit and grain farming. Himachal Pradesh is one of the few Indian States to discourage industries that pollute the environment.[4]

Unlike the vast majority of India, Himachal Pradesh has pleasant summers and cold winters. The difference in climate takes on special significance as the majority of building materials used in Himachal Pradesh are imported from other parts of India, where houses are designed to keep residents cool rather than warm. The inadequate heating often leads to the household crowding a single room in an attempt to use a single heat source. This increases the transmission of communicable diseases.

---

[1] http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS/countries
[2] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html
[3] http://www.transparencyindia.org/resource/survey_study/India%20Corruptino%20Study%202008.pdf
[4] http://www.webindia123.com/himachal/economy/industry.htm

Healthcare in India

Healthcare in India is provided privately and publicly. Government-funded healthcare is provided free to the user. It accounts for 3.9% of the GDP.[5] However, with persistent issues of corruption in India this may not in fact reflect the actual expenditure on healthcare. There are approximately 0.65 physicians per thousand people (one-quarter of the rate of New Zealand)[6] and doctors typically see over 80 patients per day.

The health system is essentially based on a British model where the patients have a primary referring doctor and specialists based in hospitals. In order to qualify as a doctor medical students must complete a four-and-a-half year degree followed by a one-year internship. At this point the doctors are licensed to become "MBBS doctors," India's equivalent of a General Practitioner. MBBS doctors in India are not regulated as tightly as General Practitioners in New Zealand and they may perform operations such as caesarean sections if they feel they are competent.

Entrance into a specialist training programmes is obtained through sitting a post-graduate examination**.** This is an examination testing all areas of medicine, after which the examinees can apply to their desired specialty. The doctors then enter a training programme- typically three years- after which they are qualified consultants.

Common medical conditions in India include infectious diseases such as tuberculosis and also malnutrition. A driving factor for both these illnesses is low income. For tuberculosis and other infectious diseases, low income leads to crowding which elevates the rates of transmission. Malnutrition also stems from low income and can impact on the morbidity and mortality of infectious diseases. A statistic demonstrative of the severity of malnutrition in India is the rate of children under five that are underweight: 43.5%. This rate is higher than sub-Saharan Africa and globally it is second only to East Timor. [7]

Medicine in rural India is poor compared to urban India. In addition to low access to equipment and investigations, there are also a high proportion of unqualified practitioners and incorrect diagnoses.[8] It is also difficult for rural providers to hire doctors as there is a perception of reduced career progression in rural areas. The Government has recognised a demand for improved rural health and has tripled investment in rural areas with the National Rural Health Mission.

Manali

Manali is a town of approximately twenty thousand residents in the Kullu Valley, Himachal Pradesh. Manali is at an altitude of 2000m and is regularly isolated by winter

---

[5] https://www.cia.gov/library/publications/the-world-factbook/geos/in.html
[6] https://www.cia.gov/library/publications/the-world-factbook/fields/2226.html
[7] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2224rank.html
[8] Das J, Holla A, Das V, Mohanan M, Tabak D, Chan B. In urban and rural India, a standardized patient study showed low levels of provider training and huge quality gaps. Health Aff (Millwood). 2012 Dec;31(12):2774-84.

snowfalls. Although it has been resided in for thousands of years it first gained the attention of Western tourists in the late 1800's when the region was used for hunting by British soldiers. The first permanent British settlers were in the early 1900's and in the 1920's grounds for a hospital were negotiated between the British settlers and the local priests. Since the Chinese conquest of Tibet, refugee camps have been established near Manali- as they have throughout Himachal Pradesh.

Manali developed rapidly in the 1980s, when the town became a hub for tourists. It remains popular with honeymooning Indian couples and western tourists also. Tourism is the main form of income for Manali, especially during the summer months.

Healthcare in Manali is provided through Lady Willingdon Hospital, a mission hospital established in the early 20th century, and the newer, government-funded hospital. Public perception of these institutions vary, with my personal experience being that the Government Hospital has a local reputation for inferior care. Because of this reputation, Lady Willingdon Hospital treats the majority of the locals.

Lady Willingdon Hospital

Lady Willingdon Hospital is a charitable 55-bed hospital in Manali, Himachal Pradesh. It has specialists in Obstetrics & Gynaecology, Paediatrics, Internal Medicine and General Surgery. The number of inpatients fluctuates with the seasonal tourist population- in summer the hospital is over capacity, while in winter the hospital hosts approximately twenty patients at any one time. The number of junior doctors also fluctuates- between 3-4 in the winter and 5-6 in the summer.

Lady Willingdon Hospital provides healthcare to an enormous land area. While the nearest hospital to the south is approximately 50 kilometres away, the nearest hospital to the north is 2 days travel. During the summer, Lady Willingdon Hospital offers outreach clinics to the nearby valleys, whose populations lack any other form of modern healthcare. During the winter, populations in the adjacent valleys and towards the north of Manali are isolated by snow and are unable to receive any healthcare. While the Indian Government is in the process of initiating aeromedical support to these populations, emergent conditions still carry a 100% mortality.

Facilities at Lady Willingdon Hospital are rather incredible given the low level of funding they have. There are two operating theatres, an endoscopy suite, a pharmacy, two inpatient wards, an outpatients department, an emergency department, an intensive care unit, a neonatal unit and a maternity wing. In addition to these clinical buildings there is also an administrative building and a residential area for staff. Lady Willingdon also recently bought a refurbished CT machine, but it broke down within weeks of purchase and the hospital does not have the funds to repair it.

My time in Manali

Clinical days typically started with a ward-round. Tuesdays and Thursdays were operating days, while on other days the surgeon and the gynaecologist did outpatient clinics. The

physician and the paediatrician did clinics each day of the week while also providing cover for the junior staff, who worked in the emergency department and on the ward.

I divided my time in Manali between the four specialists roughly evenly. The absence of other medical students gave me the flexibility to work with the doctor that was doing the most interesting thing at the time.

Not being able to speak Hindi was a drawback in the clinic, as over 90% of consultations were conducted in this language. Despite this, the doctors were very good in summarising each patient in English.

Common reasons for presenting to the outpatient clinic included tuberculosis, diabetes and gallstones. The most common elective operations performed were tubal ligations and cholecystectomies.

I was surprised at the broad range of acute operations that were performed. Despite the fact that there was only a General Surgeon, orthopaedic and neurosurgical operations were attempted. These were performed in the knowledge that the patient would have deteriorated in the time it would take to receive specialist treatment.

Difficulties in providing healthcare in Rural India

Internal infrastructure

After having experienced 4 weeks in Lady Willingdon Hospital, it was impressed upon me how important internal infrastructure is in delivering first-class healthcare in rural areas. In New Zealand air retrieval and good roads has meant that any person is rarely more than a few hours away from definitive treatment. However, in India patients can be isolated for months at a time if weather conditions make transport impossible. Even in good conditions, the closest tertiary referral centre from Manali is seven hours away by ambulance.

To me it seemed that the lacking internal infrastructure was combated by having less geographic distance between hospitals. While this may have meant that the average patient was only an hour or two from the closest hospital, it also meant that the doctors had no peers who did the same specialty. In New Zealand, working alongside other specialists is important for quality control and continued professional development- not to mention sharing the on-call workload. The General Surgeon in Manali had been on-call continuously for almost two years!

Despite its faults, I can't help but feel that rural New Zealand lost a little when services were centralised. During my time in India I saw how patients' families were able to look after them at the hospital, which would have been more difficult if the hospital was further away.

Resources

I also observed how important funds are in delivering health standards. While the doctors at Lady Willingdon provided an incredible quality-of-care, throughout India a balance must be struck between quantity-of-care and quality-of-care.

Finding the balance between quality-of-care and quantity-of-care accounted for some differences in theatre. The vast majority of operations done in Manali were done under spinal anaesthetic. As there was no resident anaesthetist, this was perhaps a safer option as the patient was able to protect their own airway. It also allowed for a greater number of patients to be treated as there is no need for post-anaesthetic care. The downsides to this include that the procedures were more unpleasant for the patient and it was hazardous as the surgeon was forced to multitask by controlling both the anaesthetic and the surgical aspects of theatre.

A lack of resources also meant the doctors had less diagnostic capability. An example of this was seen by Lady Willingdon Hospital lacking the funds to repair the CT scanner. In addition, the pathological laboratory was limited in size. These aspects may contribute to differences in health between rural India and urban India.

Gibraltar

Gibraltar Background

At the mouth of the Mediterranean, Gibraltar lies on a historically important cross-roads between the Atlantic and the Mediterranean, Africa and Europe. Due to its strategic location it has been fought over for millennia and was most recently conquered by an Anglo-Dutch Force in 1704. Despite ceding Gibraltar in perpetuity following this battle, Spain continues to lay claim to Gibraltar. The mutually antagonistic attitude between the Spanish and the Gibraltarians has caused a tumultuous relationship between the two, with Spain memorably closing the border for much of the 1970s.

Gibraltar's population of 30,000 are an assortment of Gibraltarians, Moroccan, Indian, Pakistani and British expatriates. Additionally, 20,000 Spanish nationals cross the border each day for employment. The population is densely packed into Gibraltar's six-square kilometres, with many people living in apartments on reclaimed land. Gibraltar's economy is supported by its status as a tax haven, and overseas corporations and banks provide much of the country's income.

Health in Gibraltar

Although it occasionally outsources work to private hospitals in Spain or the United Kingdom, Gibraltar has had to develop an independent healthcare system.

Healthcare in Gibraltar is provided by both the public and the private sector. The Gibraltar Health Authority receives 90 million pounds[9] in public funding each year for the 30,000 citizens (4,979 USD per capita compared to NZ's 2,900 USD per capita).[10] The healthcare system is based on a British model with General Practitioners providing most primary care and referring to hospitals when needed. However, unlike in New Zealand, General Practitioners fees are entirely covered by the government with no user charge.

Primary healthcare facilities include a public GP practice of approximately 20 General Practitioners. The two hospitals are King George V Psychiatric Hospital and St Bernard's General Hospital.

The spectrum of disease in Gibraltar is comparable with New Zealand, with chronic conditions on the rise.

St Bernard's Hospital

St Bernard's General Hospital is a 210 bed facility with a range of specialties, including Accident and Emergency, Paediatrics, Obstetrics and Gynaecology, Pathology, Medical subspecialties and Surgical subspecialties. Gibraltar does not have the population to support a full time Plastic Surgeon, Cardiothoracic surgeon or Neurosurgeon- consultants from these

[9] http://www.gha.gi/about-us/gha-introduction/
[10] http://www.beehive.govt.nz/release/health-budget-increases-record-156b

specialties are intermittently flown out from the United Kingdom to provide clinics and perform operations.

The vast majority of the specialists in St Bernard's Hospital are from overseas. Common origins include the UK, continental Europe, India and Pakistan.

St Bernard's Hospital is equipped with 3 operating theatres, an endoscopy suite and a 12 bed Intensive Therapy Unit.

My time in Gibraltar

During my seven weeks in Gibraltar I was able to trial a range of different specialties. I had initially hoped to spend all seven weeks in Emergency, but the department was unable to host me for more than three weeks. Because of this, I spent two weeks doing General Surgery and one week each of Orthopaedics and Obstetrics.

Accident and Emergency: St Bernard's Hospital Emergency Department was overseen by 6 doctors, 4 of whom worked during any 24-hour period. The Department comprised of a resuscitation bay, 3 major treatment rooms, 4 observation beds and 5 minor treatment rooms. Each day was typically rather hectic, with patient waiting times of up to 4 hours not uncommon. However, due to Gibraltar's low population base (and its residents' good fortune!), I only saw one true emergency during my three weeks in the department. The majority of my time I spent dealing with common presentations such as sprained ankles, with an occasional presentation that was severe enough to require admission.

The non-emergent nature of the patient presentations continually raised the ire of the doctors working in the A&E, who felt the local GP services were not properly being utilised. On talking to the patients, many of them stated that there was no point in attending the GP, as they felt the GP would only refer them to the hospital for radiological or haematological investigations. Others said that they would prefer a four-hour wait in A&E compared to waiting to see a GP, whose next available slot was often 4 days away. One patient who highlighted the need for more GPs was a young woman who presented to the Emergency Department to get a repeat prescription.

Ultimately the clinical workload was similar in nature to General Practice in New Zealand and although the doctors were frustrated I found it incredibly valuable and gathered a lot of clinical experience.

Orthopaedics: My week in Orthopaedics involved going to the operating theatre and spending some time in the clinics as well. My day in theatre was in fact the first day I had spent in an orthopaedic theatre during my medical degree and I experienced what was in fact a rather rare operation- it was only the second time the surgeon had performed it in his twenty years of practice.

The days spent in clinic involved a trauma clinic, a chronic orthopaedic clinic and a post-op clinic. The trauma clinic was the most valuable of the three- I was already familiar with a

couple of the patients having seen them in the A&E a week earlier. While I was an observer for most of the clinic time, the surgeon provided a lot of teaching in between patients.

Obstetrics: The maternity unit in Gibraltar is staffed by midwives and obstetricians and sees approximately 400 births per year- I was fortunate enough to see a birth before lunchtime on Monday. Perhaps the most surprising thing about Gibraltar's maternity unit was the number of male midwives- Gibraltar alone has triple New Zealand's number of male midwives. The specialists do both antenatal clinics and Gynaecology clinics, and I was able to observe these. One particular highlight was practising Ultrasonography.

General Surgery: The last two weeks of my elective were spent doing General Surgery. Gibraltar was staffed with 4 General Surgeons. Most days began with Ward Rounds, after which I would attend theatre. The benefits of doing General Surgery in a small hospital is that it is indeed general. In smaller hospitals the General Surgeons take over much of the workload of the plastic surgeons and urologists. A broad scope of practice was particularly important for me as my previous General Surgery exposure had been in Christchurch where I had seen little more than mastectomies.

During my time doing General Surgery in Gibraltar I was able to see a broad range of pathology, from hyperlipidaemic pancreatitis to bowel cancer to oesophageal varices to melanomas. Perhaps the most bizarre thing I saw during my time in General Surgery was liposuction. A plastic surgeon was visiting from the UK and allowed me to join his operating list. Rumour had it that the patient got their way onto the operating table by being friends with Gibraltar's Chief Minister- talk about buying votes!

Difficulties in providing healthcare in Gibraltar

Provision of adequate services

Compared to India, Medicine in Gibraltar was much more similar to New Zealand. The scope of medicine was more similar and both cultures were working to the same standards regarding quality-of-care.

This causes problems for the less common specialties such as neurosurgery and cardiothoracic surgery. As a first-world nation the focus is on top quality healthcare: orthopaedic operations performed by a General Surgeon- as I saw in India- would be unacceptable in Gibraltar. While routine services are provided by outreach clinics from British specialists, patients in acute need for these services require costly transfers to external hospitals (often Britain, as many Gibraltarians refuse to receive treatment in Spanish hospitals due to long-standing grievances).

I am interested to see if Gibraltar changes its management of this issue, as acute access to sub-specialists is also an area affecting rural New Zealand.

Preventative health measures

Another difficulty faced by the Gibraltar Health Authority is the low level of preventative health measures. Alcohol and tobacco in Gibraltar are largely untaxed and smoking rates in Gibraltar approach one-third of the population[11] compared to 15 % in New Zealand.[12] Prior to 2011 there was no formal cessation support offered by Gibraltar's healthcare system.

In addition to high levels of smoking, 60% of Gibraltar's population are either overweight or obese.[13] This increases the general morbidity of the population and increases the need for healthcare.

[11] http://www.gha.gi/wp-content/uploads/Media%20Library/GHA%20Board%20Reports/GHA%20Board%20Report%2017th%20July%202012.pdf
[12] http://www.stats.govt.nz/Census/2013-census/data-tables/totals-by-topic-mr2.aspx
[13] http://www.gha.gi/wp-content/uploads/Media%20Library/GHA%20Board%20Reports/GHA%20Board%20Report%2017th%20July%202012.pdf

Overall Impression

This Elective gave me a great opportunity to observe how healthcare systems in other countries deal with the problem of isolation.

The concept that struck me as the most valuable was the idea of a rural-based specialist, such as the specialists in Manali. They were able to provide sound quality care in an environment where the patient was close to family support. However, this is a concept that New Zealand moved away from in the late 20th century.

Despite the centralisation of services that occurred during this period, in recent years the practice of highly-trained rural doctors has been somewhat restored. In the last decade the Australian College of Rural and Remote Medicine has developed a training programme for GPs which involves learning advanced skills in one specialty.[14] In New Zealand, Rural Hospital Medicine is a recently-recognised specialty with an emphasis on providing trained, well-rounded generalists to "deliver optimum patient outcomes in rural hospitals". [15]

I think that both the Australian and New Zealand strategies should be pursued. Both offer increased services to patients in rural areas and may mean the patient is able to receive definitive care closer to home. In the future I hope that these programmes continue to be well supported as I believe they can provide quality care for those in rural areas.

[14] https://www.acrrm.org.au/vocational-training
[15] https://www.rnzcgp.org.nz/what-is-rural-hospital-medicine/