BNMT NEPAL

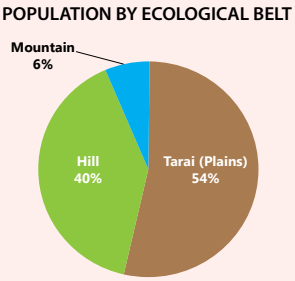
Serving the People of Nepal

ANNUAL REPORT 2022/23

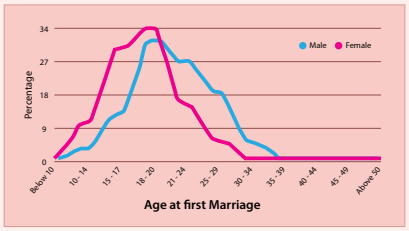
UNITING TO BUILD HEALTHIER COMMUNITIES

Thanks to Our Funders

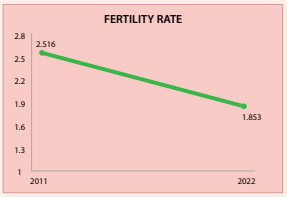
A snapshot of developing Nepal: Seven interesting facts revealed by Nepal Census 2021



The population of Nepal in 2021 is 29,164,578. Two thirds of people live in urban areas. We have 142 ethnic communities, 124 languages as mother tongue and 10 major religions.

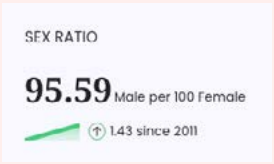


The average age of first marriage is 21. Still, it is noteworthy that 35.9% of girls and 32.6% of boys get married at the age group 18-20. Also, among girls, 30.4% marry at the age group 15-17, followed by 10.2% at age group 10-14. Similarly, among boys, 12.3% marry at the age group 15-17, followed by 3% at age group 10-14. This strongly evidences the occurrence of child marriages in Nepal.

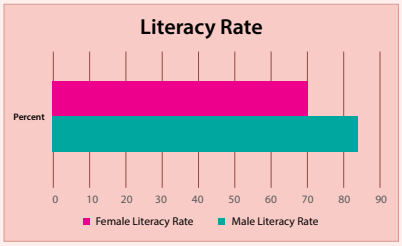


The fertility rate continues to steadily decline from 2.52 in 2011 to 1.85 in 2021.

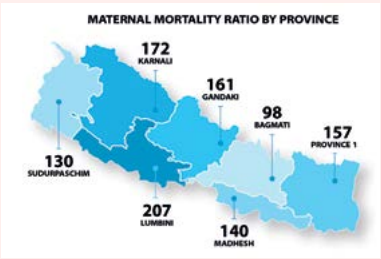
Nepal's female population is 51% and the male population is 49%.



The literacy rate of population aged 5 years and above is 76% increasing by 10% since 2011.

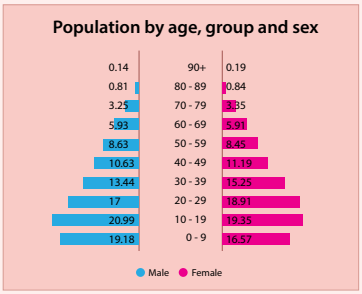


The literacy rate is lower in female population (69%) than in male population (83%). The reasons include reduced girls' attendance in schools, menstrual taboos, child marriages and gender based violence.



Maternal mortality, one of the leading causes of death for women of reproductive age in Nepal, is 151 per 100,000 live births in 2021. Maternal mortality decreased from 239 per 100,000 live births in 2016. The SDG target by 2030 is less than 70 per 100,000 live births.

The gender ratio of Nepal is changing due to entrenched preference for male children: The female population below 19 years of age is shrinking in comparison to boys of same age group.



Generating Evidence
to Inform Policy

Accelerating the
Elimination of Infectious
Diseases

BNMT NEPAL

Serving the People of Nepal

Strengthening
Health Systems

Building Resilient
Prosperous Communities

Improving
Mental &
Adolescent Health

Foreword from the Chair of the BNMT Board

Mr Mahesh Sharma

Chairperson
Birat Nepal Medical Trust

Providing services, caring the people who need it and generating evidence can move hand in hand – this is what we have learned and achieved this year. This year has been yet another year of satisfaction not just because we were able to serve more people and generate valuable evidence for improving people centred care, but for being able to be closer to the people and winning their heart. Thanks to all national and international partners whose financial and other support made this happen.

As a working principle, BNMT worked closely with Ministry of Health and sub-national health institutions at provinces and municipalities to ensure we remain relevant in joining hands with government at all levels in its effort to serve the community.

We are pleased to offer you this annual report which gives you all the exciting achievements, innovations, lessons learned and stories from the field.

BNMT collaborated with National Tuberculosis Control Centre (NTCC) in piloting an innovative treatment regimen (WHO-approved 3HP treatment regimen) for latent tuberculosis infection (LTBI) in adults. This is first of its type piloting in the country. This treatment prevents adults infected with the TB bacteria (but in latent stage) from developing active TB. The result of the pilot shows that the regimen is acceptable among the patient and health workers; it can be integrated within the current health care delivery system; and is replicable. BNMT Nepal was able to provide support to NTCC by supplying emergency TB drugs during acute shortage of TB drugs.

As a result of lesson learned from Covid, the country stepped up in advance technology like pathogen genomic. The government is strengthening its capacity towards this through strengthening laboratory system and other supportive interventions. BNMT organized a Pathogen Genomics and Bioinformatics Training Workshop, collaborated with government and other partners in gene sequencing of TB pathogen, which continued the momentum advancing pathogen genomics science in Nepal.

BNMT continues to work on bringing improvements in comprehensive, patient-centric prevention, treatment and cure to our communities in Nepal. Towards this, we organised policy dialogue, consultative meetings, advocacy, trainings and other supportive works. For example, we organised a policy dialogue to discuss the findings of a systematic review on vitamin A supplementation for children in Nepal; Covid Kurakani to expand understanding around Covid, and shared the national experiences and research findings at national and international forums. We also encourage out staff members to access early career research grants so that their research interest and capacity is enhanced. Three staff members were able to get such grants this year. Among all this, social determinants of disease are often forgotten and lack of evidences further hinder the policy makers to design appropriate socio economic package to support people with TB. BNMT generated some evidence, for designing socio economic package for TB patient to improve the treatment outcome. Another important work was empowering adolescent through comprehensive sexuality education in collaboration with local municipalities in Sindhupalchowk district. This was a great experience and achievement to see how small inputs at right time and right age can substantially change adolescent's (and their parents) behaviour.

We are expecting a break through this year in September when the leaders from all the countries meet at UN high level meeting on TB. High level policy makers and delegates from Nepal are expected to attend the meeting, make commitment at international level and translate it back to the national level to accelerate the effort to eliminate the TB. We urge the leaders for their willingness to follow the science, the data and the evidence, and take actions accordingly.

We are committed to continue our work to improve the health of Nepali people. We extend our hands to collaborate with government, funders and other partners in the country and outside.

Message from the Executive Director

Mr Raghu Dhital

Executive Director
Birat Nepal Medical Trust

I am pleased to present the BNMT annual report for 2023, highlighting the key activities and achievements of BNMT Nepal throughout the year. In 2022/23, BNMT Nepal implemented 19 projects, strengthening healthcare access and service provision in remote areas. These initiatives aim to reduce barriers and improve health outcomes for underserved communities.

A notable achievement this year was the successful pilot implementation of the WHO-approved 3HP treatment regimen for latent tuberculosis infection (LTBI) in adults. This treatment prevents adults infected with the TB bacteria from developing active TB and is significantly shorter and easier to take than the old treatments available. This project, carried out in collaboration with the National Tuberculosis Control Center (NTCC), marked the first time such a treatment was introduced in Nepal and has shown that the treatment regimen is not only acceptable, but in high demand among communities in Nepal with a high burden of TB. BNMT will continue to collaborate with communities and the government to bring innovative, patient-centric care models to Nepal.

Through rigorous research, data collection, and trend analysis, BNMT has produced evidence-based reports and policy briefs, that have empowered decision-makers to incorporate our effective healthcare strategies into policies to address critical healthcare issues. Additionally, BNMT Nepal was able to provide support to NTCC by supplying emergency TB drugs during a logistics crisis, that prevented dangerous treatment delays and interruptions for TB patients.

As Nepal moved beyond the COVID pandemic, BNMT Nepal completed data collection for the Epidemic Intelligence consortium project, which implemented SARS-CoV-2 sequencing and long COVID cohort analysis. BNMT organized a Pathogen Genomics and Bioinformatics Training Workshop in collaboration with five experts from the University of Melbourne, Australia and the consortium partners, which continued momentum advancing pathogen genomics science in Nepal. Forty scientist from laboratories across Nepal participated and we hope to conduct further trainings in coming years.

BNMT Nepal also celebrated its 10-year anniversary on September 21, 2022. BNMT Nepal builds on the 55-year legacy of BNMT-UK in serving the people of Nepal to improve health and wellbeing of Nepali people The event gathered founders, board members, government representatives, collaborators, stakeholders, and the esteemed BNMT-Nepal board. The event reflected on the achievements of BNMT over the past 60 years and shared our strategic vision for the future with our partners. A ceremony was also held to recognize extraordinary contributions from members of the BNMT team with special awards. Choosing the recipients of these awards was a particularly tough challenge, given the dedication and commitment shown by all of our staff, but the justice of the selection committee choices was reflected in the loud cheers from the recipients' team mates during the ceremony. Congratulations to all the winners.

These remarkable achievements would not have been possible without the unwavering team spirit demonstrated by our dedicated staff members. I express my sincerest gratitude to each and every one of them for their tireless work, unwavering effort, companionship, and invaluable contributions to the organization.

I also extend heartfelt appreciation to our national and international partners, including the Ministry of Health and Population, NTCC, Nepal Health Research Council, Health Offices, Provincial Health Directors, Centre for Molecular Dynamics-Nepal, GENETUP, TB Nepal, Bheri hospital, Koshi hospital, Teku hospital, and local government authorities. Their unwavering support and collaboration have played a crucial role in our achievements and the positive impact we have made. Lastly, I want to express deep gratitude to all our generous donors. Your continued support and trust in BNMT have been vital to our ability to carry out our mission, particularly during these challenging times. We highly value your partnership and remain committed to making a significant difference together. Our unwavering dedication to enhancing healthcare access and quality for all the people of Nepal remains at the forefront of our work. As BNMT continues its efforts, we strive to create a healthier and more equitable Nepal for all its citizens.

2023-A Turning Point for TB?

Dr Maxine Caws
Senior TB Researcher

Global tuberculosis (TB) elimination efforts are gathering momentum- in September 2023 the United Nations will hold the second High Level Meeting on TB. This is a meeting convened by the 193 UN member states to reach agreement on cooperation and solutions for urgent global issues. This will be only the fifth ever High Level Meeting convened on a health issue, reflecting the urgent need for action against TB. We sincerely hope that the resulting Political Declaration will commit to, and deliver, the necessary investment for the elimination of TB.

We hope this will be an historic turning point in the history of TB- from Tragedy towards Triumph.

Last year, 17,000 Nepalese lost their lives to TB- a preventable, curable disease. Global investment for TB in 2021 was less than half the amount needed to provide universal access to quality prevention, diagnosis and treatment (5.4 billion of the needed 13 billion USD). To change the situation, we must change our approach.

We hope that soon a better TB vaccine will be available, to replace the weak and ineffective BCG vaccine, which was developed over 100 years ago. This year, the Wellcome Trust and the Bill and Melinda Gates Foundation made a visionary joint commitment to support the necessary clinical trials to develop a candidate TB vaccine known as M72. Sixteen other TB vaccine candidates are currently in different stages of development, including an mRNA based vaccine, and WHO also launched the TB Vaccine Accelerator Council this year.

While we await the perfect solution of a truly effective vaccine, BNMT continues to work on bringing improvements in comprehensive, patient-centric prevention, treatment and cure to our communities in Nepal. This year BNMT introduced the innovative WHO approved treatment regimen for prevention of TB known as 3HP in two districts of Nepal. We achieved very high acceptance and completion rates which reflects the urgent demand for improved treatments, including preventive therapy, from affected communities. We also continued our work on community based active case finding, developing socioeconomic protection strategies, providing TB support clubs, studying the genomic epidemiology of TB in Nepal, understanding and reducing TB-related stigma, supporting MDR TB hostels, and developing evidence based nutritional support, alongside our advocacy and awareness activities.

Investment in TB is one of the most cost-effective public health interventions, and we sincerely hope that global leaders at the UN High level Meeting will finally heed the Call to Action and Commit to Action to END TB.

IMPACT 2 TB: Optimising Interventions to Accelerate TB Elimination in Nepal

Tuberculosis remains a severe public health problem in Nepal: 47 Nepalese die every day from this preventable, curable disease. One of the reasons is lack of access to effective, timely diagnosis which means that many community cases of TB remain undiagnosed and continue to transmit TB within their communities. IMPACT 2 TB is implementing intensive TB active case finding to close this gap in access in TB diagnosis. We are using high coverage of a molecular diagnostic test for TB called GeneXpert which is highly accurate in four districts: Mahottari, Chitwan, Pyuthan and Bardiya. The evidence gathered from this project will inform the scale-up of the national TB Programme case finding strategies at national level. We are collecting data on additional yield of TB cases, health economic evaluations from patient and health system perspectives, mathematical models of the impact of the intervention on the epidemic, and qualitative evaluations to gather views from stakeholders including policymakers and people affected by TB.

Studies have shown that GeneXpert testing as the first line test for TB can contribute significantly to increase the TB case detection and get people onto the correct treatment. The government of Nepal has prioritised the expansion of GeneXpert testing to diagnose the TB but has limited funding to achieve this aim. Through this project, BNMT supported five new GeneXpert machines (4-module) in government health centres of Bardiya, Pyuthan and Mahottari districts.

As for any disease, prevention of TB is better than cure. The IMPACT 2 TB project is therefore also piloting the new WHO recommended preventative regimen for TB known as 3HP for the first time in Nepal.

This 12-dose 3HP shorter TB preventative regimen is easier for people to complete than the older, longer treatment regimens and has fewer side effects. The 3HP therapy is being piloted in Chitwan and Pyuthan districts, in collaboration with the National TB Control Centre. This will help us understand how to scale-up TB preventative therapy in Nepal to prevent people infected with the TB bacteria becoming sick with TB.

Preventative therapy also reduces transmission of the disease, because it eradicates the bacteria from the body before it can cause disease and transmit to other people. The WHO algorithm was followed to identify people infected with TB bacteria who are not sick with active TB disease and are eligible for preventative therapy. We conducted extensive consultations and orientations to diverse stakeholders about latent TB infection management at province, district and hospital level.

Five hundred household contacts of TB cases have been enrolled to treatment and 95% have now completed the 3HP regimen. We have achieved a very high level of acceptance of the therapy among eligible individuals, high completion rates of the regimen among those taking the treatment, and shown that there is high demand among communities with a high TB burden for scale up of preventive TB therapy.

To achieve the END TB strategy goals for TB elimination in Nepal, scale-up of TB preventative therapy is essential. This project has developed the tools and modalities to implement the 3HP regimen in Nepal and shown that it is a practical solution in high demand among TB affected communities. We will continue to work with the National TB Control Centre and other stakeholders to implement innovative evidence-based TB patient-centric care for Nepali people.

30,514
screened for TB

22,774
tested for TB through GeneXpert

1,366
new cases of TB identified and treated through GeneXpert testing

500
Household contacts with latent TB enrolled for the TB preventive therapy

Case story: In the fight against TB!

Sita GC, BNMT Field Supervisor, had an important task at hand - identifying cases of tuberculosis (TB) through active case finding and preventing new cases. She met Dev Kumari BK, a 72-year-old woman with TB. Sita made a visit to Dev Kumari's home to check her family members for signs of TB and to offer them preventative therapy. Out of the six eligible adults for testing, Baburam BK, Dev Kumari's son who worked 90 km away in Libang, was absent. During her discussion with the family, Sita discovered that Baburam had always accompanied his mother to medical appointments when she became sick. Realizing the potential risk, Sita immediately reached out to Baburam, to explain the possibility he had been infected with TB and advising him to undergo testing.

Baburam heeded the call and visited the clinic. Luckily he was not sick with TB but tested positive for latent TB infection. Without wasting any time, Baburam started on the 3HP medication treatment for latent TB to clear the bacteria from his body and prevent him falling sick with TB in the future. Reflecting on his decision to come for testing, he shared, "Witnessing my mother's suffering due to tuberculosis made me realize the importance of early diagnosis and treatment. I understood that latent TB can also cause harm and needs to be addressed swiftly."

However, Baburam's work situation in Rolpa posed a challenge for him to attend weekly medication visits. Sita was able to co-ordinate between the latent TB focal person at Pyuthan Hospital and Bhingri Primary Health Care Center in Rolpa to ensure timely medication delivery, so Babaram could complete his treatment. Tragically, Baburam's mother succumbed to tuberculosis while he was still taking the treatment. Sita understood his responsibilities to perform rituals at his mother's home and again stepped in to ensure Baburam could complete his treatment course by personally delivering his medication during the seventh and eighth weeks. Overwhelmed with gratitude, Baburam expressed his heartfelt appreciation, saying, "I am truly grateful to Sita ji for her assistance and support during this challenging time." Baburam persevered and completed the full duration of his latent TB treatment despite his grief. Sita's support and kindness left a lasting impact on him. We offer our sincere condolences to Babarum and his family on the loss of their mother, and wish Babarum the best of health on his future life journey.

TB Recovery Project

One third of TB patients in Nepal experience food insecurity, meaning that they often do not have enough money to afford sufficient food. Our previous work revealed the depth of food insecurity and malnutrition among TB patients, and we designed the TB RECOVERY project to better support people during their recovery from TB. Already poor, many people with TB experience catastrophic costs from having TB disease, losing their livelihoods and having to pay for medical tests and incorrect treatments. This can spiral them further onto malnutrition and extreme poverty, which slows down recovery from the disease and also increases susceptibility to TB in other family members. The World Health Organization recognizes the importance of nutrition for recovery from TB and has recently called for more research and evidence to inform the design of effective, locally appropriate macronutrient interventions to support TB affected families in recovery.

The TB RECOVERY project funded by the Australian John Burge Trust Fund provided six months' nutritional support to 200 TB patients in high TB burden districts of Nepal - Banke, Pyuthan and Makwanpur, alongside training in nutrition educational counselling to female community health volunteers. Over 1,030 family members have received the nutritional support from this project.

The second phase of the project involves scale up of nutritional support to TB patients in Nepal. The project will also conduct 24-hour food recall survey for beneficiary groups and a control group, compare and evaluate the clinical outcomes and conduct a policy dialogue to disseminate the findings as well as explore strategies for scale-up integration of nutritional support within the TB FREE Nepal initiative of the National TB Programme.

Funds raised through British Embassy Burns Night

BNMT was honoured to be chosen as the recipient charity for this year's Burns Night event hosted by the British Embassy and The British School Kathmandu. Funds raised will benefit families affected by TB through our TB RECOVERY project. Sincere thanks to the organizers, generous donors and our dancing partners for this opportunity!

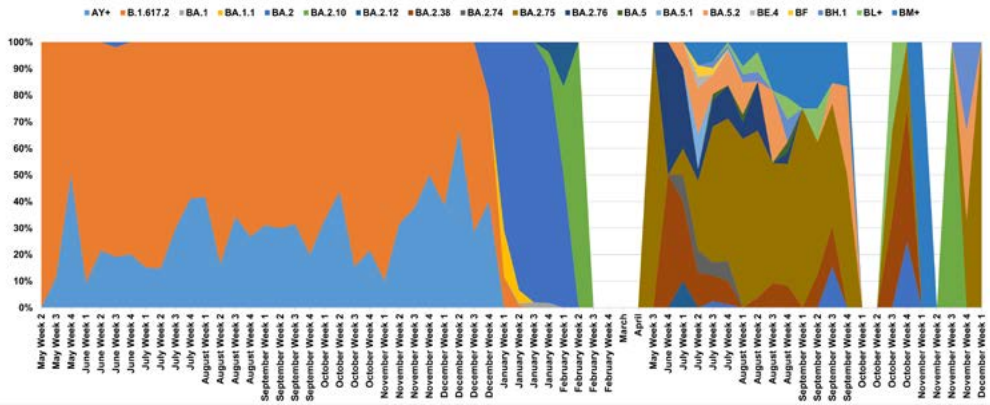
Epidemic Intelligence Project

The COVID19 pandemic in Nepal showed that the country is vulnerable to rapid and widespread transmission of emerging infections, due to very high levels of internal and external economic migration.

Understanding of the true patterns of introduction and subsequent transmission of the virus has the potential to inform our understanding of the way in which a similar future pathogen with pandemic potential may seed in migration hub countries.

The Epidemic intelligence project used an advanced technique called whole genome sequencing to help us understand how the SARS-CoV2 virus which causes COVID changed over time in Nepal. The project collected and sequenced SARS CoV2 samples from three locations spanning Nepal: Bheri Hospital in Nepalgunj (Far West), Koshi Hospital, Biratnagar (Eastern Nepal) and Sukraraj Tropical Infectious Diseases Hospital in the capital city, Kathmandu (central region). Sequencing was performed in Nepal at the Centre for Molecular Dynamics Nepal and validated by the University of Cambridge, UK, who were our consortium partners.

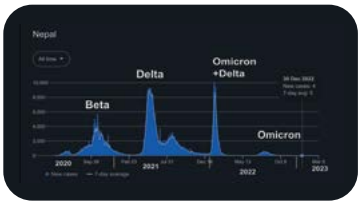
The project also aimed to understand the condition known as Long COVID in the Nepali population. We know that many people worldwide continued to experience symptoms long after their episode of illness with COVID. These long term effects often severely affect quality of life for those affected. We therefore followed-up the participants at three, six months and 1 year to understand the frequency and symptoms they experienced as long-term complications of COVID-19.



The findings showed Nepal to be vulnerable to multiple introductions of emerging pathogens, due to Nepali diaspora and high internal and international migration. Three major waves of COVID19 were experienced in Nepal. Twenty percent of patients reported illness lasting 12 weeks or more (long COVID). People with diabetes, and hypertension had a higher risk of long COVID. Women were also at slightly higher risk than men for unknown reasons. Even a single dose of Vaccination was highly protective against severe disease and long COVID.

A significant proportion of COVID patients continue to suffer long COVID symptoms and struggle to access appropriate care, with a large proportion having co-morbidities. Therefore, specialist care and research centres are needed to understand and treat the condition. Vulnerable patient groups experiencing long COVID require a broad range of support interventions including psychosocial support, livelihood support, personalized management plans and subsidized medical care.

There is an urgent need to further strengthen human resource capacity in molecular biology and bioinformatics within Nepal. There is an opportunity now to redeploy the molecular diagnostic capacity expanded during the pandemic to address endemic infectious diseases and other emerging diseases of concern, including influenza, antimicrobial resistance, drug resistant tuberculosis and dengue.



Over 2048 participants recruited and over 2000 patient samples successfully sequenced

Nepal experienced three major waves of COVID19 caused by: Beta variant, Delta, & Delta and Omicron co-circulating

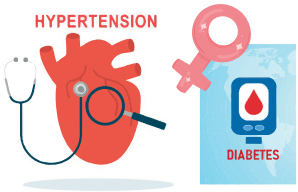
More than a fifth of the participants had a migration history, of which 8% had a history of international migration

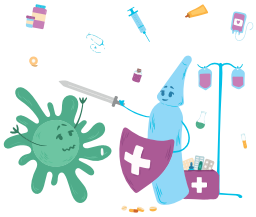
Key Findings of Epidemic Intelligence Project

20% of participants reported long COVID, broadly defined as symptoms lasting longer than 12 weeks

Diabetes or hypertension and female gender were risk factors for long COVID.

At least one vaccine dose was protective against Long Covid OR= 0.679 [95% CI 0.499-0.925], P=<0.014.





Building Collaborations and Capacity

Rajindra Napit, Laboratory Manager and Molecular Genetics Researcher
Center for Molecular Dynamics Nepal

As part of the Epidemic Intelligence project I visited Ian Goodfellow's Laboratory at the University of Cambridge, UK to advance my training in pathogen genome sequencing. Dr Anna Kovalenko worked with me to validate our sequencing data, sequencing Quality Control, quick report generation, and metadata preparation for cluster analysis. I also visited the distinguished institutions of Wellcome Sanger Institute, Liverpool School of Tropical Medicine, London School of Hygiene and Tropical Medicine, and St. Andrews University to discuss expanded collaborations on other pathogen sequencing projects. My trip to these pioneering research centres allowed me to gain some face-to-face learning opportunities around the ongoing projects. We discussed potential collaborations, technology transfer and strengthened partnerships for future projects I am excited to continue fruitful connections with these institutes.

Pathogen Genomics and Bioinformatics for Public Health Workshop Nepal 2023

Dr Kristy Horan, Bioinformatics Section Leader with the Microbiological Diagnostic Unit Public Health Laboratory, The Peter Doherty Institute for Infection and Immunity.

Pathogen genomics is a powerful tool to rapidly identify and characterize pathogens. This approach involves three distinct stages – whole genome sequencing of isolates from clinical samples (wet lab processing of samples), bioinformatic analysis of the genome of the pathogen (also referred to as 'dry lab'), and finally interpreting and reporting these results to inform public health actions.

On behalf of the Centre for Pathogen Genomics at the Peter Doherty Institute for Infection and Immunity, University of Melbourne, I along with four other scientists were delighted to travel to Kathmandu to deliver a 5 days training in pathogen genomics for public health focusing on the bioinformatic analysis aspect of pathogen genomics. The content encompassed viral and bacterial genomics, and their use in both research and public health settings. The training was conducted in two parts, the first portion designed for a broad audience and consisted of a series of lectures to increase participants' knowledge of bioinformatics. The second section went into more detail with the application of this knowledge and included hands on practical activities using common genomic analysis tools to analyze viral and bacterial genomes as well as real life case studies demonstrating how genomics can be used to support public health investigations for a smaller group of attendees. The delegates at the workshop were so inquisitive! The level of engagement and enthusiasm was outstanding, it made the workshop fun and so rewarding - it was a pleasure to work with a group of such driven scientists.

Sustain Project: Emergency Support and Sustenance to Communities Affected by Crisis

The global COVID-19 pandemic has had catastrophic impacts in many countries, including Nepal. In the acute phase of the crisis, there were severe disruption to regular health service delivery along with a dire shortage of personal protective equipment (PPE) materials for frontline workers and community volunteers. The SUSTAIN project was designed to respond to the COVID crisis and support continuity in health service delivery. As the situation evolved, with changing community needs and strengthened response from other stakeholders, BNMT adapted the SUSTAIN project to address urgent gaps in the COVID response during different phases of the pandemic. The SUSTAIN project was implemented in five districts Mahottari, Chitwan, Bardiya, Morang and Pyuthan from spring 2020, with funding from BNMT UK and Americares. Since November 2022, SUSTAIN phase V was designed to help rebuild and strengthen health services in the aftermath of the pandemic. This phase was implemented in six districts including Banke through the support of Americares. BNMT supported 5 qualified laboratory staff in health facilities to help staff cope with the post-pandemic surge in medical testing for other diseases. Ultimately the support helped staff manage the workload, reduced overcrowding and increased access of public to health services.

Winter on the Terai can be bitterly cold, particularly for impoverished families without adequate clothing or fuel. We therefore also provided winter care packages to the most vulnerable TB patients precipitated into extreme poverty during the pandemic, and to those with multi-drug resistant TB receiving treatment at MDR TB hostels. The project also supported new furniture and bedding for two MDR TB hostels in Banke and Morang. This improved the experience of patients who must spend over six months living at the hostels, which have only basic facilities. Nearly 300 TB patients were beneficiaries of the project, receiving winter care packages, hygiene kits or bedding.

BNMT supported refurbishment of 40 beds, including improvements such as providing a side locker for each bed so that patients could store personal belongings. Refurbishment included new bed frame and mattress, mosquito netting, bed sheets, pillow cases, pillows, blankets, electric hot water bags for each patient, water filters

and hot water dispensers. We also fitted new flooring for two MDR TB hostels at TB Nepal Nepalgunj and NATA Morang. Through this project we have aimed to make the MDR TB hostels a little more comfortable for residents receiving care for this devastating disease. We continue to consult with patients and caregivers on the most effective ways to provide holistic care and support during treatment.

Case story: Yes, I am recovering from TB!

Sunita, 51 (name changed), resides in a remote area of Makwanpur district with her husband and daughter. Sunita has physical and mental impairments, she relies on disability allowance from the government as her primary source of income. Her husband also receives a senior citizen allowance. When Sunita started experiencing symptoms of TB such as cough, night sweats, loss of appetite, and fever, she initially hoped they would go away on their own. However, as her condition worsened, she sought help at the nearest health facility, which referred her to the local Hospital for TB testing. Her husband had no choice but to borrow 2,000 rupees from a neighbor to cover the expenses, promising to repay it later.

Sunita was diagnosed with TB. Due to the distance between her home and the hospital, arrangements were made for her to collect her medicine at a nearby health post, which she reached by foot. Sunita also receives nutritional support through our TB Recovery Project. These packages have made it possible for Sunita to consume nutritious meals to help her complete the full treatment course of six months and achieve a complete cure. She noticed straight away that her weight increased and she felt more confident about recovering. Sunita expresses her gratitude to the BNMT district team and emphasizes that medications alone cannot cure TB; proper nutrition is essential for a full recovery.

Sunita's story underscores the challenges faced by individuals in remote areas and the importance of comprehensive support in tackling TB.

TB Nutrition

The World Health Organization recommends systematic assessment of nutritional status, counselling and therapeutic and supplementary feeding for nutritional support for people with TB. However, knowledge about the dietary intake pattern and gaps during TB treatment in Nepal is scarce. TB Nutrition, funded by BNMT UK, was conducted to understand the dietary intake patterns, nutritional status (BMI), and access to food of people affected by TB. The study was designed to identify the gap between the recommended dietary requirement and the real consumption patterns to inform design of an appropriate evidence based food support package for people with TB.

We conducted 24-hr dietary recall interviews to assess the dietary pattern of people with TB in Morang district and focus group discussions to understand the barriers and facilitators to accessing proper nutrition.

The findings showed more than 70% of people with TB in Morang are underweight. The major barriers reported were poverty and low purchasing capacity, lack of land ownership or fertile land and poor food preparation and consumption practices. The potential solutions proposed by participants include monthly food support, targeted cash transfers and nutrition education on food intake and preparation.

Target TB

Tuberculosis remains the world's deadliest infectious killer. To achieve elimination, we need to improve our understanding of TB epidemiology and improve our techniques for diagnosis and prevention. Sequencing of the bacterial genome is a technique that allows us to compare the DNA sequences of the bacteria from different people. By analysing this data, we can understand how it is spreading between people and communities, and how it has changed over time. We can also use the technique to understand patterns of drug resistance and to improve the diagnosis and treatment of drug resistant strains of TB. This technique is one of our most effective tools to understand and respond to infectious diseases with better treatments, vaccines, and diagnostic tests.

TARGET TB is the first large-scale whole genome sequencing project of TB in Nepal. It will help us to understand how TB transmits within our communities and inform the development of more effective interventions for elimination. The project is using TB isolates from three contrasting districts of Nepal (Kathmandu, Pyuthan and Banke). These areas represent different urban and rural environments. A better understanding of current TB transmission patterns in these different settings, and the relative contribution of cross border migration, reactivation of latent TB, drug resistance and strain virulence, will help us develop more effective approaches to targeting resources for TB control. The project is being conducted by a consortium including BNMT, GENETUP, TB Nepal, Centre for Molecular Dynamics Nepal and the University of Melbourne (Australia) in collaboration with the NTCC.

1607
TB samples collected from three districts across Nepal

1146
Mycobacterium tuberculosis Cultures processed for DNA extraction at GENETUP

1146
DNA samples sent to University of Melbourne for sequencing.

Laboratory Capacity Building at Primary Health Care Level in Chitwan and Mahottari Districts

Professor Andy Ramsay, Infection and Global Health specialist

The microscope is the essential piece of laboratory equipment. As well as being used to diagnose life-threatening infections such as tuberculosis, malaria and meningitis it is needed for diagnosis of serious non-communicable diseases including blood disorders. A good quality, robust microscope is a sound investment and, if well-cared for, will serve for decades. Sadly, microscopes in many resource-poor settings do not receive the care and basic maintenance that they need to withstand the rigors of intensive use, heat and humidity and it is not uncommon to find broken microscopes, or microscopes giving inaccurate test results due to poor maintenance. Few low-income or middle-income countries have systems in place to routinely check, maintain or repair microscopes in healthcare laboratories.

For the past 5 years BNMT, in partnership with provincial and district health authorities have been supporting

laboratories in Bardiya, Chitwan, Dhanusha, Makwanpur and Mahottari districts with theoretical and practical training of laboratory staff, and the service and maintenance of equipment, including microscopes.

In November 2022 I conducted an inventory of microscopes in Chitwan and Mahottari Districts, to assess their condition, carry out basic service and maintenance and, where necessary and possible, repair microscopes together with BNMT and district TB focal personnel and laboratory staff.

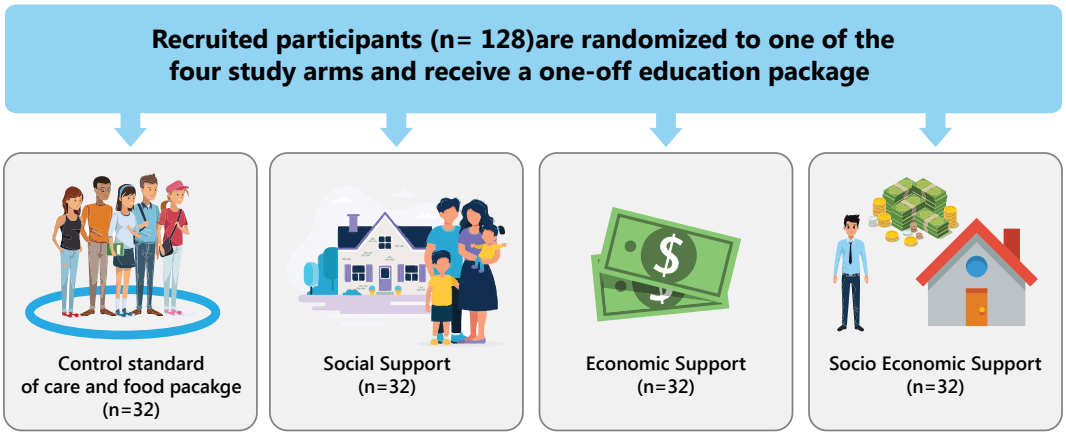
A total of 42 microscopes in 17 laboratories were serviced. Fourteen microscopes were returned to good function with minor repairs. Six health laboratories did not have a well-functioning microscope to provide a good quality diagnostic service The microscopes in four of these health facilities were repaired on the spot. In the two remaining health facilities of Chitwan, the District Public Health Office through Jaya Ram Duwadi, the TB Focal Point, arranged for replacement microscopes to be provided. All 17 of the laboratories visited now have at least one well-functioning microscope.

Laboratory staff also received refresher training on how to care for their microscopes.

Certificate of Appreciation from Our Provincial and District Partnerships

ASCOT: Addressing the Social Determinants and Consequences of Tuberculosis in Nepal

TB is known as a 'disease of poverty' because vulnerability to TB is highly affected by social and economic conditions. Therefore, WHO's End TB Strategy advocates social and economic (socioeconomic) support for households affected by TB. There is no evidence to help policymakers understand the best way to design effective strategies to provide socioeconomic support for TB-affected households in low-income countries like Nepal. To address this, we developed a locally-appropriate support intervention for TB-affected households in Nepal. ASCOT is a small pilot study to field-test the feasibility and acceptability of the proposed support interventions so that we can design a bigger study and apply for funding to test the interventions on a larger scale. We conducted a pilot randomised-controlled study with mixed-methods process evaluation in four regions of Nepal with high levels of both TB and poverty: Pyuthan, Chitwan, Mahottari, and Morang. The pilot study recruited 124 people with TB notified to the Nepal National TB Program. The integrated process evaluation recruited 27 multisectoral stakeholders including National TB programme staff, TB patients and ASCOT field team members. We also organised 12 TB clubs to support people affected by TB in the districts.



All the intervention packages were well received by the participants. The participants found the cash useful to buy medicine and nutritious food. However, participants reported a preference for the combined social and economic support package because it provided both education and counselling on TB as well cash support to buy food and medicine. The social support alone which included a calendar and animated movie about stigma encouraged participants to engage with TB services. Participants appreciated the practical value of the TB calendar, which contained information about TB, for keeping track of their medicine intake as well as to mark important festival dates. In addition, the animated movie empowered participants to recognise and challenge discrimination towards TB patients. As one of the participants during the focus group discussion shared his experience: *"If only money is provided, it would be used just for eating. But it is important to learn about how TB is transmitted and caused. TB doesn't only happen to poor people and, when some people get TB, they overthink and often get stressed and have psychological impacts. When they are like that, if they can understand TB better, they will get relief."* [IDI participant, socioeconomic arm].

COVID Kurakani (Conversations) Project

During the COVID pandemic, the media exploded with discussions of the pandemic which included complex terminology such as 'sequencing', 'genomes', 'variants' and 'mutations', which often left the public perplexed and bewildered. BNMT conceived Covid Kurakani (COVID conversations) to bridge the gap between experts and the public in discussions of the scientific response to the pandemic and genome sequencing.

With the generous support of the Wellcome Trust, as part of the Epidemic Intelligence project, BNMT teamed up with the Centre for Molecular Dynamics and Galaxy Television to produce three 'Question Time' style panel discussion programmes for broadcast on primetime national television. The programmes were designed to facilitate understanding between researchers and the public regarding perspectives, concerns and perceived benefits of pathogen sequencing and to broaden the audience for dissemination of the Epidemic Intelligence project findings.

We recorded the three episodes in Biratnagar (eastern Nepal), Kathmandu (The capital city in central Nepal) and Nepalgunj (western Nepal). The project was enthusiastically received by stakeholders and the public. Government partners, emphasized the need for broader COVID Kurakani style public engagement for the understanding of science surrounding infectious diseases in Nepal. Priority topics for future events were vaccines for infectious diseases, and dengue which has changing epidemiology in Nepal due to climate change.
The COVID Kurakani episodes were broadcast weekly in a primetime slot during a popular National television programme, Galaxy 4K TV's 'This Morning Live' in November-December 2022. A different expert panel was convened for each of the three episodes, to allow a broader range of researchers and public health specialists to participate in the series, and to present diverse perspectives across stakeholders. The panellists included clinical experts working in the Epidemic Intelligence partner hospitals, senior government representatives from the Ministry of Health and Population, laboratory experts including bioinformaticians and microbiologists, molecular epidemiologists, and public health experts. Each episode explored different aspects of pathogen sequencing and its applications.

The second major goal of the Covid Kurakani project was to build capacity for high quality public engagement within the Birat Nepal Medical Trust team. We conducted an EDGE analysis of our public engagement capacity and held a workshop to design a five-year strategic plan for public engagement. Our vision is to embed public engagement throughout our work, from conception, through design, implementation and dissemination of findings.

The Covid Kurakani television programme was a new venture for BNMT and we were delighted by the enthusiastic response and stimulating discussions from the expert stakeholders and audiences, both the live audience and the broadcast audience. One of the audiences shared their experience, "Through the 'COVID Conversation', I along with many people who had previously infected with COVID got the opportunity to ask our queries with various experts; the experts also shared their experiences and knowledge, through which we got to learn a lot about Covid. This program gave me inspiration and courage to speak my mind. After the program, I shared my knowledge and experiences that I got to know from Covid conversation with my friends, family and neighbours. I was so happy to watch the broadcast of the program in TV."

We continue to explore new creative ways to engage with the public- Keep watching!

Covid Kurakani can be watched on YouTube or through our website, scan here visit our YouTube channel:

BNMT in the Media

Publications

Title: Should all pregnant women take calcium supplements in Nepal? GRADE evidence to policy assessment

Date Published: 14 October 2023

Citation: Pokhrel KN, Thapa S, Garner P, Caws M, Dhital R, Gurung SC, Fox T, Shrestha S. Should all pregnant women take calcium supplements in Nepal? GRADE evidence to policy assessment. Global Health Action. 2022 Dec 31;15(1):2128283.

Link: https://doi.org/10.1080/16549716.2022.2128283

Description: This review assessed the evidence for blanket calcium supplementation in pregnant women in Nepal to prevent pre-eclampsia. The review concludes that targeting high-risk pregnant women and improving antenatal care may be a better approach to prevent pre-eclampsia mortality in Nepal as the projected reduction in maternal deaths in Nepal due to blanked calcium supplementation was estimated to be low, while implementation costs were high.

Title: Interventions pathways to reduce tuberculosis-related stigma: a literature review and conceptual framework

Date Published: 23 September 2023

Citation: Nuttall C, Fuady A, Nuttall H, Dixit K, Mansyur M, Wingfield T. Interventions pathways to reduce tuberculosis-related stigma: a literature review and conceptual framework. Infectious Diseases of Poverty. 2022 Sep 23;11(1):101.

Link: https://doi.org/10.1186/s40249-022-01021-8

Description: TB stigma remains one of the major challenges in TB control and hence prevention is vital to achieving the WHO's END TB strategy target of eliminating TB. This literature review examines the existing stigma reduction interventions, their challenges and success and proposes a conceptual framework to design effective TB-stigma reduction interventions.

Title: Comparing cross-sectional and longitudinal approaches to tuberculosis patient cost surveys using Nepalese data

Date Published: 10 June 2023

Citation: Bengey D, Thapa A, Dixit K, Dhital R, Rai B, Paudel PR, Paudel R, Majhi G, Prasad Aryal T, Sah MK, Pandit RN. Comparing cross-sectional and longitudinal approaches to Tuberculosis Patient Cost Surveys using Nepalese data: Tuberculosis cost survey approaches. Health policy and planning. 2023 Jun 11.

Link: https://doi.org/10.1093/heapol/czad037

Description: In this study, we compared the financial impacts of TB estimated by cross-sectional and longitudinal survey approaches. The findings highlighted the importance of longitudinal approach to capture important aspects of costs and socio-economic impacts of TB. However, resource-constrained countries might experience challenges to implement longitudinal surveys, and the cross-sectional approach with interviews during the initial stage of continuation treatment phase may be more feasible in high TB burden countries.

Title: Comparing Additionality of Tuberculosis Cases Using GeneXpert or Smear-Based Active TB Case-Finding Strategies among Social Contacts of Index Cases in Nepal

Date Published: 17 July 2023

Citation: Gurung SC, Dixit K, Paudel R, Sah MK, Pandit RN, Aryal TP, et al. Comparing Additionality of Tuberculosis Cases Using GeneXpert or Smear-Based Active TB Case-Finding Strategies among Social Contacts of Index Cases in Nepal. Trop Med Infect Dis. 2023 Jul 17;8(7):369.

Link: https://www.mdpi.com/2414-6366/8/7/369

Description: The study compared the additionality of TB cases using GeneXpert and Smear-Based active case finding strategies among social contacts in Nepal. The application of GeneXpert technology in TB case diagnosis in Nepal showed a higher contribution to increasing TB notifications (20%) compared to smear microscopy (12.4%). The findings suggest that implementing GeneXpert testing among social contacts of people diagnosed with TB across Nepal could help close the notification gap and accelerate progress towards ending TB.

Project Horizon: Breaking Taboos and Empowering Adolescents through Comprehensive Sexuality Education

In Nepali society, conversations about sex and sexuality are often deemed taboo. However, it is crucial for young people and adolescents to receive information on these topics to empower them to make informed decisions and have a voice in their sexual and reproductive health and rights (SRHR). Comprehensive Sexuality Education (CSE) is an age-appropriate and culturally relevant way of teaching about sexuality and relationships, which provides scientifically accurate and non-judgmental information. Studies have shown that it is effective in improving knowledge and behavioural intentions around sexual health among adolescents.

While sexual education is included in the school curriculum in Nepal, parents and teachers, who should be the trusted source of information for adolescents, often do not talk about sex and sexuality due to social conventions and lack of their own knowledge. Adolescents, therefore, often hesitate to ask questions about sex and sexuality to teachers and parents and instead seek advice from their peers, who may give inaccurate information. To address this gap, Birat Nepal Medical Trust (BNMT Nepal) designed and successfully implemented "Project Horizon" from December 2021- December 2022, to improve access to information on sex and sexuality for adolescents through Comprehensive Sexuality Education (CSE) in six schools of Indrawati Rural Municipality, Sindhupalchowk.

Project Horizon implemented twenty different activities reaching around 2,500 direct beneficiaries including adolescents, their parents, teachers, policy makers, community people and Female community health volunteers. The project played crucial role in providing adolescents with skills such as communication, leadership, negotiation, problem-solving, and knowledge surrounding sexual and reproductive health Adolescents were

empowered to make informed decisions in life, raise their voices and concerns with their peers, teachers, and parents. Adolescents and other stakeholders discussed challenges and potential solutions in their communities, including child marriage, adolescent pregnancies, unsafe abortions, gender-based violence, sexual abuse, and mental health issues. The initiative received strong support from stakeholders and the municipality, and we thank all the many project partners who made this initiative successful. Such projects can ensure the next generation of Nepalese are able to make informed life choices appropriate for themselves, and enjoy fulfilling, healthy and respectful relationships throughout their lives.

Acceptability and feasibility of self-sampling of Cervical cancer screening in Nepal

Under Project Horizon, a qualitative study was conducted to explore the acceptability and feasibility of self-sampling for cervical cancer screening in Nepal with the service providers. The data was collected between August to November using semi- structured key informant interviews with service providers including gynaecologist, pharmacist, oncology nurses, online service providers, and representatives from department of health services of Kathmandu valley. The study found that service providers were positive about the use of self-sampling of cervical cancer screening in urban settings of Nepal but emphasised the need for media campaigns to increase the awareness of women regarding self-sampling before implementing in the country.

166
Parents, teachers & students engaged in dialogues in 6 intervention schools

120
Peer educators formed; conducted quarterly orientations and meeting

6
Adolescent friendly information corners established in 6 intervention schools

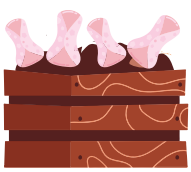
300+
Community people observed municipal level SRHR Awareness program

40
Municipal stakeholders oriented on relevance and context of CSE and SRHR

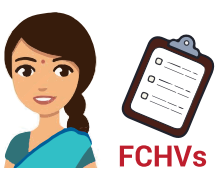
Project Horizon Achievements

13
Sanitary vending machines developed and distributed to 12 schools in collaboration with National Innovation Center

17
Teachers trained on CSE



6
Waste disposal pits constructed to improve Menstrual health and hygiene in the schools



57
Female Community Health Volunteers (FCHVs) oriented on SRHR and cervical cancer

530
School adolescents oriented on CSE

BNMT Participation in Scientific Conferences and Seminars

Women's Health Conference 2023

BNMT Nepal was delighted to participate in Nepal's first ever Women's Health Conference in March 2023 with more than 400 participants.

Saki Thapa, Advocacy, Networking and Resource Mobilization Manager from BNMT gave a presentation on our project: "Feasibility and Acceptability of Alternative Approach to Cervical Cancer Screening in Nepal: Service Providers' Perspective" and presented a poster on "Barriers and Facilitators to Access Sexual reproductive health Information and Services amongst Adolescents during Covid 19 Pandemic in Sindhupalchowk, Nepal". It was clear from the conference that there are many exciting and innovative projects addressing women's health in Nepal, and we look forward to participating again next year.

9th National Summit of Health and Population Scientists in Nepal

BNMT Nepal presented two research studies in the 9th National Summit of Health & Population Scientists organized by Nepal Health Research Council (NHRC) with the theme 'Research for Health: Translating Evidence & Innovation into Actions', in April 2023.

Research Manager, Kritika Dixit gave a presentation of our research on 'Stigma, depression and quality of life of people undergoing tuberculosis treatment in Nepal'. The study highlights the need for locally appropriate psychosocial interventions to decrease stigma and increase mental health as well as the quality of life for people affected by TB in Nepal.

Research Associate, Rajan Paudel, presented a poster reporting our evaluation of the dietary pattern and nutrient intake of people affected by TB in Nepal. The findings showed the majority of people with TB to be underweight and not meeting the recommended amount of energy and nutrients. This highlights the urgent need for interventions such as food support for people affected by TB to improve recovery, reduce the long term health consequences and speed a return to health.

4th Health and Social Protection Action Research & Knowledge Sharing (SPARKS) Network Meeting

SPARKS is an international interdisciplinary research and knowledge sharing initiative on social protection and health including Tuberculosis.

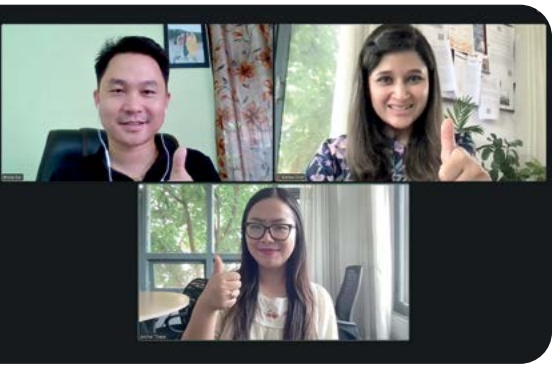
Birat Nepal Medical Trust (BNMT Nepal) was delighted to participate in the SPARKS Network Meeting in October 2022 in beautiful Stockholm, Sweden, hosted by the Karolinska Institutet. In the meeting, Research Manager, Kritika Dixit, shared the findings of her study entitled 'Characterizing and assessing the socio-economic impact barriers, and facilitators

of accessing TB diagnosis and care in Nepal before and during the COVID19 pandemic.' Also, Health Economist, Anchal Thapa presented perspectives from Nepal on the future role of the SPARKS Network and ideas for an expanded scope of activity. The two-day meeting was a great opportunity to discuss our research programme with other experts in the field, hear about our colleagues work to inform our own and develop ideas for future collaborative projects in the health and social protection sphere. Our attendance was supported by funding from Karolinska Institute. Thanks to all our SPARKS friends for a great and stimulating meeting.

53rd Union World Conference on Lung Health 2022

The 53rd Union World Conference on Lung Health 2022 was held virtually from November 8-11, 2022. Our Research Manager Kritika Dixit, Project Manager Bhola Rai and Health Economist Anchal Thapa, presented BNMT research findings.

Ms Dixit presented her PhD study on stigma, depression and quality of life among people with TB in Nepal. The study evaluated stigma, depression and quality of life along treatment journey at intensive (2-3 months of treatment) and at continuation phase (5.5 to 6.5 months of treatment). The study showed stigma and depression were common and persisted throughout TB treatment and self-reported quality of life was low at intensive phase of TB treatment but improved towards end of the treatment. To decrease stigma, and improve mental health and quality of life of people with TB, there is therefore an utmost need for locally appropriate psychosocial interventions.

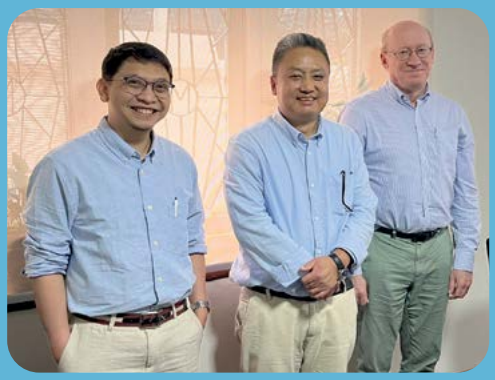


Ms. Thapa presented 'Putting Our Best Cost Forward: A Comparative Analysis of Cross-sectional and Longitudinal Approaches for TB Patient Costing Studies' in a poster. The study analysed the data from the longitudinal patient costing survey of the IMPACT TB project to address methodological challenges in TB patient costing surveys. The study showed that the estimates of cost and socio-economic impact of TB were significantly different when applying cross-sectional or longitudinal approaches. The longitudinal approach, although being resource intensive, can capture important aspects of costs and socio-economic impacts which is missed by cross-sectional approach.

Mr. Rai presented the findings of Medical Research Council (MRC, UK) funded research Addressing the social determinants and consequences of tuberculosis "ASCOT" pilot trial. The primary aim of the study was to evaluate the feasibility and acceptability of different socioeconomic support packages for TB-affected households in Nepal. The study showed that the socioeconomic support packages for TB-affected households in Nepal would be feasible, acceptable, and suitable for evaluation in a full scale randomised controlled -implementation trial.

Congratulations

Congratulations to our former director, now Dr Suman Chandra Gurung, for successful completion of his PhD entitled, 'Active case finding for tuberculosis in Nepal', under the project IMPACT TB funded by European Union Horizon 2020. Hearty congratulations and best wishes for his future career!



Scholarly Pursuits: My Phd Experience and Research Insights

Kritika Dixit, Research Manager, BNMT Nepal

In my decade-long journey in public health research, I've been deeply committed to enhancing healthcare equity in rural communities in Nepal through evidence-based approaches. Three years ago, in May 2020, I embarked on a PhD program in Global Health at Karolinska Institutet, Sweden. My initial research aimed to uncover the social and economic impact of tuberculosis (TB) and enhance access to TB care in Nepal. However, the onset of the COVID-19 pandemic, significantly affecting global and Nepalese health, urged me to identify swift actions to mitigate the preventable health consequences of both diseases and elevate healthcare quality. Fortunately, I secured early career research grants from the Farrar Foundation and the Royal Society of Tropical Medicine and Hygiene, crucial for understanding the immediate and long-term impacts of these pandemics and advancing my PhD project.

My research comprises four distinct studies. One study, conducted with TB patients before the COVID-19 pandemic to grasp the social impact of TB, including stigma and depression, revealed disheartening yet expected results. Over 221 people with TB participated, with nearly half feeling guilt about their TB status and keeping it hidden. Additionally, a third of those undergoing TB treatment experienced persistent depression. These findings are alarming, considering preliminary data from another study indicating that the COVID-19 pandemic disrupted TB care access and exacerbated existing healthcare barriers. Hence, my studies emphasize the urgency for comprehensive strategies and decisive actions to meet the global target of ending the TB epidemic by 2030.

For me, a PhD transcends delving into scientific papers and conducting research. It fortified my theoretical knowledge and infectious disease expertise, enabling successful funding applications and fostering my growth as an independent researcher. I've diligently shared my knowledge with colleagues at BNMT, fortifying the Research Department I lead. My PhD journey has also bolstered collaborations with TB program stakeholders, academicians, national and international researchers, and emphasized the necessity of people-centric healthcare for Nepalese citizens. Furthermore, I've presented research findings at over 20 national and international high-level conferences, enhancing the recognition of our work at BNMT.

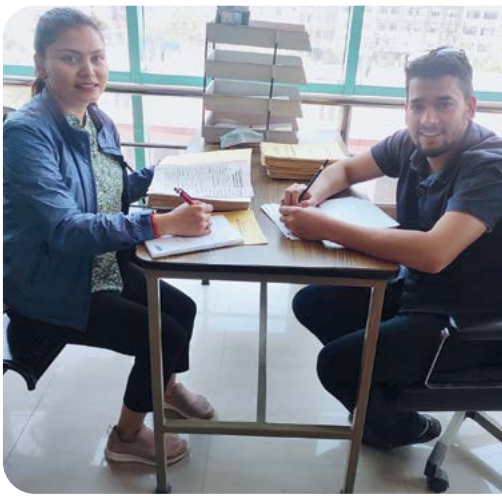
In conclusion, nearing the completion of my PhD program fills me with excitement. I express deep gratitude to my supervisors and mentors for their invaluable guidance, propelling my consistent progress throughout this transformative journey.

Gender Violence Awareness and Response Training

Sadly, gender based violence remains very common in Nepali society. Through their engagement with households in many different circumstances, our community volunteers may become aware of situations involving gender based violence and other related issues. To help our staff to better recognise signs of such situations, and to guide them in how to support the victims to access help, we conducted a two-day training in January 2023 for our field staff led by Dr Poonam Rishal, a gender based violence expert and board member. The training was also designed to help our staff to recognise and prevent such harmful behaviours within the organisation and their personal lives.

The training was interactive and explored power and privilege, gender based violence types, causes and impacts, safe places, survivor centered approaches, and guidelines for managing disclosures of violence in the field. The training method was case based discussions/Interactions, games, role-plays, group work, storytelling. Participants' feedback was very positive and reported the training was very interactive and informative. Participants appreciated the opportunity to develop psychosocial support counselling skills which will support field staff in responding effectively to gender based violence issues in the communities they serve.

Royal Society of Tropical Medicine and Hygiene, UK Grants



Our colleagues, Ms Swastika Shrestha, Ms Anchal Thapa and Mr Rajan Paudel have been awarded early career research grants with the Royal Society of Tropical Medicine and Hygiene and National Institute of Health.

Ms Shrestha's research is titled **"Intersectional psychosocial impact of Epilepsy: a gender lens approach."** Her research aims to explore and understand the lived experiences, psychosocial impact and quality of lives (Qol) of people living with Epilepsy in Nepal. Epilepsy has been historically associated with severe stigma and discrimination. Consequently, People with epilepsy have multiple adverse psychosocial comorbidities such as increased levels of stress, social dissatisfaction, individual isolation, social stigma and helplessness which is eight times higher than the general population. These psychosocial stresses can create a negative spiral, increasing morbidity and health-care costs, reduced wellbeing and increasing negative treatment outcomes. For patriarchal societies like Nepal, intersectionality of stigma against people living with epilepsy, gender bias and traditional mental health stigma amplifies the discrimination and barriers to health and wellbeing. Consequently, little is known about the lived experiences of people living with epilepsy in Nepal which silences the voices and prevents improvements. The study will recruit participants from two Epilepsy treatment centers in Kathmandu to understand the lived experience, needs and barriers to effective care through a gender lens. The findings will contribute to an evidence base for development of patient centric interventions through advocacy. The research duration is from January 2023 to June 2024.

Ms Thapa's research is titled **"Towards the achievement of universal health coverage in Nepal: An economic analysis and acceptability study of the use of drones to transport medical commodities in hard-to-reach areas of Nepal"**. The use of innovative drone technology in the healthcare sector is gaining momentum in different parts of the world. Medical drones have the potential to overcome barriers to health access by reaching hard to reach areas of the world. BNMT Nepal piloted the DrOTS project in Pyuthan district for TB sputum sample collection to improve access to care in remote areas., Ms Thapa's research project will assess the costs of the drone delivery system to understand how to improve cost-effectiveness and expand coverage efficiently. The study aims to determine the best-case scenario for implementing drones for transportation of medical commodities in remote, rural districts and the acceptability of this intervention in Nepal. The evidence inform the on-going discussions among stakeholders, including the Ministry of Health and Population, to develop drone transport systems for Nepal's remote rural populations.

Virtual Implementation Modelling MDR-TB

Mr. Paudel's research is entitled, "**Developing virtual implementation models for implementation of new multi-drug resistant tuberculosis diagnostic technologies in Nepal"**. He aims to develop virtual implementation models to help guide policy makers in deciding which new diagnostic tests for TB are the best for Nepal.

Out of the estimated 2,200 people with multi-drug tuberculosis (MDR-TB) in Nepal each year, only 687 were diagnosed and notified in 2020/21. Of these, just 418 were registered for treatment. These figures show more than 3 of every 5 people with multidrug resistant TB do not get diagnosed and treated through the government system in Nepal. Although the Nepal national government has been prioritizing strengthening of the laboratory network, the diagnosis of multidrug resistant TB is challenging. There are few facilities able to provide culture of the TB bacteria and testing for resistance to TB drugs, a highly specialised service. There is an urgent need for dramatic scale-up of access to drug-resistant TB testing services, particularly beyond the Kathmandu valley. However, given the limited resources, and competing priorities for healthcare spending in Nepal evidence is needed to identify the optimal approach for introduction of novel diagnostic tools for TB drug resistance testing in Nepal.

Under the supervision of Ewan Tomeny, operational modeller at Liverpool School of Tropical Medicine, Mr Paudel is developing implementation models using a technique called Discrete Event Simulation. The technique involves developing real-life scenarios in modelling software and then running simulations using modified parameters such as changing the number of samples being tested each day. This technique can be used to identify an optimal approach for a specific context (Nepal) without running costly implementation trials. The testing methods for drug resistant TB that he is exploring with the model are Xpert MTB/XDR, Whole Genome Sequencing and second line molecular line probe assays.

The project is in the model development phase and he is working with our partner laboratories to test and validate the model. The project will compare and evaluate patient, health system and community level outcomes and also predict the changes in TB prevalence and incidence from the implementation of newer diagnostic algorithms. These findings will assist policy makers in making evidence-based choices regarding implementation new TB drug resistance testing methods in Nepal.

READ -It Policy Dialogue

BNMT and partners from the Research, Evidence and Development Initiative (READ-It) organized a Policy Dialogue this year to discuss the findings of our systematic review paper entitled - 'Is routine vitamin A supplementation still justified for children in Nepal? Trial synthesis findings applied to Nepal's national mortality estimates'.

Participants included diverse stakeholders in the areas of research, nutrition and child health in Nepal including Nepal Health Research Council; Community Nursing Administrator, Department of Health Services, and representatives from WHO and UNICEF Nepal. The stakeholders engaged in a lively and broad ranging discussion, incorporating diverse strands of multidisciplinary evidence and expert opinion. It was noted that Nepal has gained significant achievements in reducing maternal and under-five mortality rates since Vitamin A supplementation was started in a few selected districts in 1993, gradually expanding to systematic national coverage. However, malnutrition and extreme poverty are still highly prevalent in Nepal and have risen since the Covid pandemic. The dialogue identified key evidence gaps and the need for further research and data on key indicators, including related morbidity, before considering a revised approach to vitamin A supplementation for Nepali children under 5. The dialogue was informed by the policy briefs and the READ-It study findings published in PLoS One, 2022 May. (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0268507).

Prof. Paul Garner from READ-It delivering a talk on Evidence synthesis and its potential for Nepal at Institute of Medicine, Teaching hospital

Patricia Weisenfeld, Country Representative from Nick Simons Foundation visit to BNMT

Obituary

It is with much sadness that we report the death this year of Dr Don Patterson, a longstanding Trustee and dear friend of BNMT UK. Johnny Penne, a fellow Trustee pays tribute to Don..

Dear Gillian,
It was very sad to read your news of Don Patterson's death. Reading all the wonderful things the BNMT family have written about Don after hearing the news, it does appear to be true that, as a poet said, what will survive of us is love.

Don lived a full meaningful life to the end, with that remarkable energy and enthusiasm for using his time learning and giving. My memories of Don go back over many years of Trust meetings where his larger-than-life presence was always an integral feature - the Don with the booming voice, always a font of knowledge and information, and obscure facts-some more relevant than others. His interjections were sometimes bemusing, often amusing and always unique, as was his enormous contribution to the Trust over so many years, first in Nepal as an early Trust member, and then as a longstanding Trustee.

I think what I remember most of Don the gentle giant was how, after arriving at the Trust meetings, following his long train journeys from York, and later from his new spiritual home in Totnes, he would immediately regale us with the tale of the new acquaintance he had just made on the train, usually a fascinating academic or explorer with whom he had discussed the finer details of nuclear physics or trekking in Nepal. As someone usually in the cowardly habit of withdrawing behind a book on such journeys, I would wonder if the new acquaintance might not have been wishing to do the same. But of course, Don was so right. What could be more important in this fragile life than connecting with each other. Is connection not what we all deeply yearn for and what we and the world so vitally need? So, Thank You Don for that important lesson. Your sonorous bass voice will be much missed down here, but I'm sure it will be a valuable addition to the heavenly choir. Of course I don't know whether heavenly choirs exist, but what better way to imagine your spirit persisting than singing in the celestial spheres.

With my love to the BNMT family spread far and wide - in death we are so often united.
Johnny

Blankets for Chepang

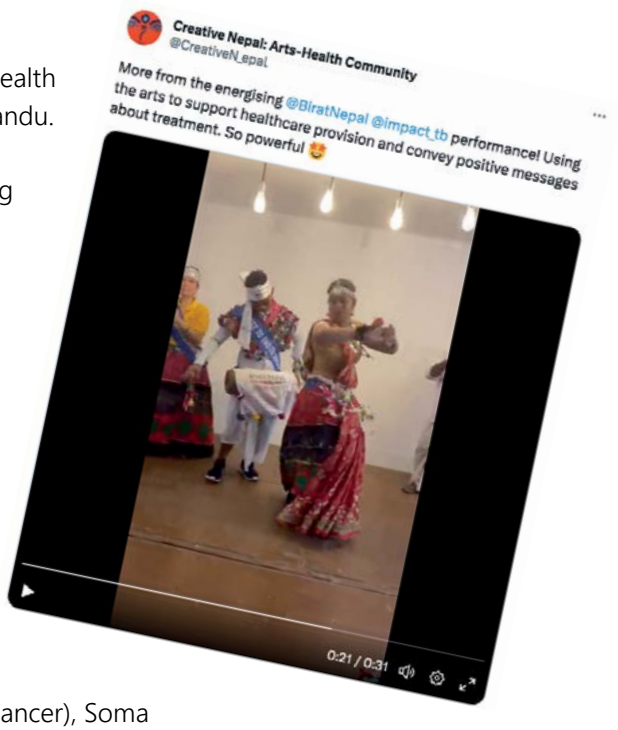
BNMT friends Sarah Gregory and Eleanor Gill generously raised funds this year to support winter blankets for the Chepang community of Raksirang, Chitwan by undertaking a tiktok challenge.

Six Chepang community members greeted Sarah, Eleanor and the BNMT team, to help carry the 35 blankets across a suspension bridge and into the community for distribution. BNMT member Bhola Rai had been engaging with the Chepang community leaders, to discuss community needs and make arrangements for delivery.

Once all of the 35 blankets were distributed, one to each household, one of the

locals guided them to a nearby waterfall to explore a cave which was inhabited by Chepang people just 30 years ago. The cave had drawings of Hindu gods, bats and lots of hidden rooms until the local eventually led them out through an exit on the opposite side to where they entered. The next day they visited the local municipal office where they were invited to visit a local Chepang household to understand the community needs and priorities around nutrition, health, well-being and daily life challenges. Through the interactions, it was clear that the blankets would provide much needed warmth for the large families living in poorly insulated homes around the community. BNMT remains committed to supporting the Chepang community in their efforts to improve socioeconomic conditions within their villages, through TB active case finding, education initiatives and programmes responsive to community needs and values.

Creative Nepal/Tharu Dance



BNMT Nepal was invited to participate in the 'Creative Nepal: Arts-Health Community' *Twitter: @CreativeN_epal,* inaugural meeting in Kathmandu. The experimental workshop established a new Nepali collaborative research platform to stimulate new ideas and solutions by connecting arts, health and entrepreneurial business. In the workshop, there were various creative sessions including Singing Bowl meditation, mural building activity, and presentations on epilepsy and stigma in Nepal by Medharma and a documentary on child marriage in rural terai (plains) by the film maker Dinesh Deokota, followed by open discussion with the filmmaker.

BNMT team performed folk 'Tharu dance' to reflect our work on TB in the community and the use of Nepali arts to advocate and promote awareness about the disease. The dance was led by our multitalented Community heath supervisors from Bardiya district – Amarnath Chaudhary (singer/composer), Ramesh Chaudhary, Rita Vaidya (dancers/musician/choreographers), supported by Gangaram Budhathoki (manager, lyricist, chorus and dancer), Soma Rai (chorus and dancer), Dipendra Panday (co-choreographer, chorus and dancer) and Bibha Dhungel (co-choreographer, chorus, dancer, singer and coordinator).

A Workshop to Remember!

In the beautiful town of Hetauda, a workshop on creative communication was held on January 19, 2023. Led by Mr. Rob Hale, 30 BNMT colleagues from head office and three district offices immersed themselves in interactive sessions, group exercises, and role play. Translated by Ms. Sangam Paudel, the workshop enhanced confidence, creativity, concentration, and skills like leadership and public speaking. Through effective communication, participants gained the power to influence others. At the end of the workshop, attendees shared that they felt inspired to utilize their learning to make a lasting impact in their communities.

Fishtail Race 2022

A group of BNMT team was excited to participate in the Fishtail Race 2022 in December 2022 to raise funds for Project Horizon which strengthened sexual reproductive health services to adolescents of Sindhupalchowk district. Former member of BNMT UK, Anne Goldie; BNMT Nepal's Senior Finance Officer, Nischal Bal Lama and Finance Officer, Dawa Rinji Sherpa completed the half marathon of 21 km whereas BNMT Nepal's Executive Director, Raghu Dhital; Chief Finance Officer, Laxmi Dahal; Project Manager, Saki Thapa; Human Resource Officer, Soma Rai; Public Engagement Assistant, Simran Bhandari; Receptionist, Renu Bhandari Lama; and Driver/ Messenger, Buddha Narayan Dangol, ran the 5 km distance. Altogether, the team helped raise funds of an impressive £1,500. Our team were thrilled to receive medals from the trailblazing Nepali trail runner Mira Rai. Among the winners of the race, Renu Bhandari Lama finished the race as the 3rd among the overall female runners in the 5K half marathon. Thank you to all our generous supporters who motivated us to Keep on Running!!

"I want to start by thanking my BNMT team for giving me this opportunity to run in the Fishtail race. It was my first time participating in a formal race. We often think that we can't accomplish something that we have never tried, but after getting involved, we realize that we can! The same happened to me. Without any training, I was thrilled to be placed third in the race; if I had worked harder, I might have been placed higher. I got the chance to realize that anything is possible if we put in necessary effort."

Renu Bhandari Lama, BNMT Nepal

BNMT UK trustee Dr Gillian Holdsworth visit to one of the health centers in Mahottari district

World TB Day 2023

World TB Day 2023 was commemorated on March 24, reflecting on this year's theme "Yes! We Can End TB." BNMT team at both central and district levels marked this day by conducting various TB awareness activities at the district and central levels in coordination with government. We also utilized our social media platforms extensively during the week (20th - 24th March) to raise awareness of TB with solidarity posts, team videos and pictures of our field activities conducted on the World TB day. We also celebrated our dedicated colleagues from partner organisations, our MDR-TB heroes, Dr Bhabana Shrestha, GENETUP, NATA and Dr Sushil Koirala, Damien Foundation.

At the central level, BNMT supported a press conference organized by the National Tuberculosis Control Center (NTCC). The Kathmandu team also participated in the program organized by the National TB Control Centre, along with other partners working in TB. At the district level, community rallies were organized with partners in Mahottari, Banke and Makwanpur district for a public awareness campaign. In Chitwan district, our team, along with local government stakeholders lighted candles in memory of people who have died from TB. In Pyuthan district, fruits & hygiene kits were distributed to people with TB at Pyuthan Hospital, mothers' group were oriented on causes, signs & symptoms, preventive measures & treatment of TB. Meanwhile, in Bardiya district, Community Health Supervisors made a solidarity video showing their commitment to end TB and the team distributed hygiene kits to the TB affected households. Similarly, our district team supported the local government in Bardiya and Pyuthan districts to interact with the journalists on TB prevention and the local plans to accelerate the TB elimination efforts. In Banke district, our team with government stakeholders performed a flash mob with TB messages, organized a rally, and distributed nutritional packages and clothes to people with TB at TB Nepal treatment centre. In Morang district, our team demonstrated screening and sputum collection methods to police trainees at Koshi Province Police Training Center, Biratnagar & also distributed nutritional packages and clothes to drug resistant TB patients at Nepal Anti-Tuberculosis Association (NATA).

BNMT Nepal 10th Anniversary

BNMT Nepal continues the work of Britain Nepal Medical Trust UK, founded in 1967. On 21st September 2022, one of the original founders of BNMT-UK, and the chair of trustees of BNMT-UK joined the BNMT Nepal team, board, our partners, collaborators and stakeholders to celebrate the Ten-year anniversary of BNMT Nepal. The event celebrated the successes of BNMT Nepal in contributing significantly to health and well-being of the people of Nepal during its first decade as a local NGO. The event was formally inaugurated by Additional Health Secretary, Dr. Guna Raj Lohani.

One of the highlights of the event was the sharing by our Executive Director, Mr. Raghu Dhital of 10 key achievements of BNMT Nepal in our first 10 years, and our 10 BNMT priorities for the future. Exceptional members of our BNMT team were also recognized during the event with Awards of Honour for their exemplary contributions to the organization and dedicated efforts to improve the health and wellbeing of our communities.

Ms. Rosemary Boere, founding member of BNMT-UK in 1967, shared her memories of the expedition the original team undertook to establish BNMT in 1968. They travelled overland to reach Nepal and had many adventures along the journey. Ms. Boere also shared the emotional journey of the early days of BNMT's work in Koshi zonal hospital and the establishment of an enduring bond between the UK and Nepal through their joint endeavors. Ms Boere reflected on some moments of tragedy, triumph and trivia, moments of joy and moments of challenge during BNMT's early days. She expressed her joy and pride in the continuing visionary work of the BNMT-Nepal team today. The session concluded with remarks from our Guests and Board Member, reflecting on BNMT achievements. An inspiring Tharu Cultural Dance with TB awareness messages was performed by our multitalented field staff from Bardiya to bring the formal session to a lively close.

Interns' Feedback

"The best part of internship is getting opportunity to learn about the effective service delivery from community level and hear the experience and views of community people towards the program".
Anjali Bhatt, Bardiya, Manmohan Memorial Institute of Health and Science (MMIHS)

"BNMT always take concern about interns... We are evaluated by not only our college but also from BNMT which helps us to work better and utilize our optimum capacity." – ***Mukesh Adhikari, Sindhupalchowk, Central Department of Public Health, Institute of Medicine (IOM)***

"One of the best part of an internship was the opportunity to learn new skills and gain knowledge...we got the chance to learn about the TB disease and its impact on individuals and communities....the valuable real-world experience of knowing the challenges and complexities of working in the public health sector helped me to develop practical skills that can be useful in future careers or academic pursuits." ***Anusha Sharma, Pyuthan, Manmohan Memorial Institute of Health and Science (MMIHS)***

Memories of the Hill Drug Scheme

James Humphery

In 1973-1975 I ran the Hill Drug Scheme (HDS) which was a part of the Britain Nepal Medical Trust. The Hill Drug Scheme was designed to solve the shortage of essential medicines in the hill communities of Nepal. We aimed to provide a regular supply of good quality drugs for trusted retailers to sell to communities at fair prices in the remote middle hills of East Nepal. I expanded the scheme to 13 shops and created the first sustainable drug delivery scheme for government health posts in the Eastern Region, employing 54 porters from a warehouse in Dharan to complete the annual delivery in 6 weeks. BNMT aimed to pioneer schemes which could one day be taken over by Nepali people.

Five months after a chance conversation about our Hill drug Scheme with a USAID official, a small fleet of Tata trucks arrived unannounced at our Biratnagar HQ with a consignment note addressed to me. There was huge amusement at my expense as it was assumed I'd put a decimal point in the wrong place on one of my orders to a supplier. However, we discovered the USAID official had advised her agency to use our hill drug scheme for the government's annual distribution in our area instead of a helicopter, the agency agreed and passed it on to The Ministry of Health who acted on the advice - but nobody had let us know of the plan!!

Our Hill Drug Scheme at that time operated from Bhojpur in the West to Ilam in the East through which I made tours meeting retailers, health workers and local government officials four times a year. Each trek would take 4-6 weeks depending on the weather, the availability of the people I needed to meet and above all, the state of paths and bridges. Some of the Swiss-built suspension bridges were getting old and dangerous while locally built bridges made of platted vines and tree branches looked scary but were usually quite safe and passable with care. Rivers and streams in flood could be too dangerous to ford so when faced with dangerous crossings one had to assess whether the nearest safe crossing point was upstream or downstream then take a detour that might be of 1-3 days.

There were no roads in the hills other than a rudimentary jeep track to Ilam (it was sometimes quicker to walk); no telephones, no internet, no electricity, haphazard water supplies and poor sanitation. Anything not sourced locally was carried in by porters. I ate, slept, enjoyed tungba (the local brew), and sometimes washed at porters' lodges (always good for information about river crossings and the best tea houses), BNMT houses (in Dhankuta, Chainpur & Ilam), with generous villagers and, on a couple of occasions, with a herdsman in his bamboo hut high on the Melke Danda. Sleeping with bhaisi (buffalo) is a rare life skill for which I failed to find a purpose in my legal career! I developed a dislike of leeches (I seem to remember burning them off with a biri) but I've retained my love of a good Dhal Bhat. I trekked with a single porter/assistant and fondly remember Lalit Bahadur's smart magenta cowboy hat, his mother's hospitality when we stayed at his home and his father urging caution when we ventured East of the Melke Danda; for a lad from Bhojpur that was a mysterious and alien land.

Back in the luxury of Biratnagar - my base at BNMT's HQ in Kafle Nivas - I made up loads for my excellent porter/assistant to deliver and ordered new stock from Patna, Calcutta and Nepal's only pharmaceutical company. It was in Biratnagar and around its streets that my motorcycling career began and ended. We had a small red Honda CB90; more moped than motorbike. Legend has it that one evening I rode along the centre line of Biratnagar runway. That much is true. The rest of the tale is best left in the mists of time where it belongs....

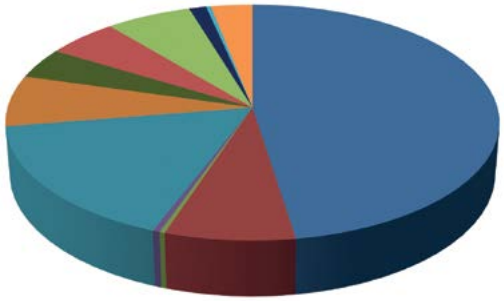
Finance Overview

BIRAT NEPAL MEDICAL TRUST

Balance Sheet as at 3/31/2080 (July 16,2023)

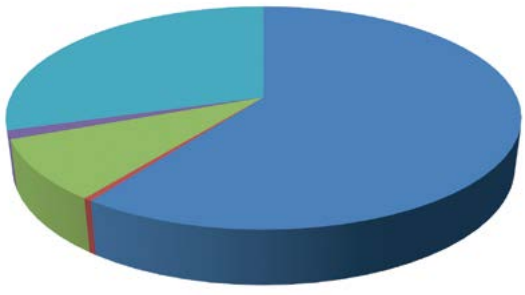
Details	2079/80		2078/79	
	Amount (NRS)	Amount (NRS)	Amount (NRS)	Amount (NRS)
Fixed Assets:				
Tangible Assets		**5,933,546**		**7,659,619**
Current Assets:				
Debtors	483,994		5,418,470	
Investments	-		-	
Cash in Hand	52,302		70,000	
Cash at Bank	42,720,035		55,232,423	
	43,256,331		**60,720,892**	
Liabilities and Payables:	**15,839,221**		**5,513,038**	
Net Current Assets		**27,417,110**		**55,207,854**
Total Assets less Liabilities		**33,350,656**		**62,867,473**
Charity Funds				
Restricted Fund		12,729,197		43,820,906
Unrestricted Fund		20,621,459		19,046,567
		33,350,656		**62,867,473**

Total Income: NRs 123,458,460



- Wellcome Trust/FCDO-Epidemic Intelligence (LSTM-PR)
- JGHT MRC UK (LSTM-PR)
- FCDO-READT IT (LSTM-PR)
- Wellcome Trust-Covid Kurakani
- Nick Simons Foundation - IMPACT TB
- NHMRC/The University of Melbourne
- John Burge Trust Fund / The University of Melbourne
- AmeriCares
- BNMT-UK
- Research Grants-RSTMH

Total Expenditure: NRs 152,497,022



- Project Activities
- Staff Training
- Administrative Cost (Programme administration & General)
- Equipment
- Human Resources (Including Project Personnel)

BNMT NEPAL

Serving the People of Nepal

Birat Nepal Medical Trust (BNMT Nepal)

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