



**DATA-DRIVEN CURRICULUM DEVELOPMENT IN
THE BACHELOR OF CLINICAL MEDICAL
PRACTICE (BCMP) DEGREE AT THE
UNIVERSITY OF PRETORIA**

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Executive summary

During the Dirisana (Dirisana+ (SANA+) 618489) grant, the Bachelors of Clinical Medicine Programme (BCMP) program significantly transformed its clinical learning environment by expanding beyond traditional hospital settings to include primary care clinics, ward-based outreach teams, and community-oriented programs. This expansion involved over 20 clinics in Gauteng, broadening the clinical training experience and exposing students to diverse healthcare contexts, including street medicine and community substance use programs (see Table 1). Despite challenges such as limited internet connectivity in some areas, the grant's provision of Samsung tablets equipped with essential educational resources ensured that students had uninterrupted access to clinical guidelines, interactive modules, and other learning materials. Using the tablets in the clinics with an e-logbook provided added value in that it allowed students to engage in self-directed learning, collaborate with peers remotely, and receive real-time feedback from instructors. In areas with sufficient connectivity, students could access up-to-date medical information and communicate with mentors, further enhancing their educational experience. This innovation enabled students to bridge theoretical knowledge with practical application in real-time, improving their ability to provide effective care even in under-resourced settings.

The Dirisana+ equipment budget of UP facilitated the development of self-regulated learning (SRL) among students by providing continuous access to educational resources via the tablets. This support has enabled students to reflect on and to address their learning needs based on clinical experiences, reinforcing their self-directed learning habits and commitment to lifelong learning. The use of electronic logbooks for daily reporting has allowed for effective tracking of student activities and

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medical record-keeping, with over 79,776 patient encounters logged from early 2022 to mid-2024. This comprehensive tracking not only supports students' learning but also informs ongoing curriculum improvements and assessment strategies.

Furthermore, the data collected has been pivotal for research and curriculum development. The data also informs the review and potential expansion of the BCMP program to a four-year structure, ensuring that the curriculum remains relevant and responsive to healthcare needs. By aligning with the South African disease profile, the data contributes to the standardization of training across institutions and provides insights into patient profiles and disease patterns, shaping the future of clinical training platforms and ensuring alignment with real-world healthcare challenges.

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1. Clinical learning environments in the BCMP Programme

During the Dirisana grant period, the BCMP program expanded its clinical training from a hospital-centric model to include primary care clinics, ward-based outreach teams, and community-oriented programs. This expansion, involving over 20 clinics in Gauteng (as shown in Table 1), exposed students to diverse healthcare settings, including street medicine and substance use programs, where advanced medical infrastructure was limited. The introduction of tablets equipped with clinical guidelines, interactive modules, and real-time communication tools added significant value by enabling students to access up-to-date information and apply their knowledge in real-world scenarios. This technology not only supported learning in under-resourced environments but also enhanced patient care by ensuring that students could make informed clinical decisions.

In lower-level healthcare settings, where reliable internet and data were scarce, the Dirisana+ funds were used to purchase routers and to pay for connectivity which ensured students had uninterrupted access to high-quality educational resources. Tablets, pre-loaded with clinical guidelines, e-books, videos, and interactive modules, played a crucial role in maintaining the integrity of their learning experience. This eliminated the need for physical books and allowed students to easily access essential materials. Tools like the Osmosis platform enabled students to bridge theoretical knowledge with practical application, even in remote settings. For rural communities, where healthcare infrastructure and resources are often limited, this technology was particularly vital, as it empowered students to access diagnostic tools and clinical guidelines on the spot, improving the accuracy of diagnoses and care in under-resourced areas. By leveraging technology, students were able to enhance healthcare delivery in rural areas, making timely, informed decisions that positively impacted patient outcomes.

The expansion of the BCMP's clinical experience to lower-level healthcare platforms allowed students to directly engage with prevalent health challenges such as chronic diseases like hypertension and HIV, as well as substance use disorders. Rotations through clinics and community programs ensured students received a well-rounded

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clinical education, with exposure to both acute and chronic health issues. Support from Dirisana+ enabled the program to extend the reach of clinical training while maintaining access to quality educational resources, ensuring students could continue developing their clinical competencies regardless of their placement. This expansion not only enriched the students' training experience but also contributed to the broader goal of addressing healthcare challenges in previously underserved communities.

Table 1: Hospitals and Associated Clinics in the BCMP Programme

Hospital	Clinic
Pretoria West Hospital	Hercules Hospital
	Danville Clinic
Mamelodi Hospital	Mamelodi West Clinic
	Stanza Bopape Community Health Centre
	Nelmaphius Clinic
	Silverton Clinic
	Stanza 2 Clinic
Tembisa Hospital	Saulsville Clinic
	Phahameng Clinic
	Holani Clinic
	Winnie Mandela Clinic
	Mamelodi West Clinic
Tshwane District Hospital	Folang Clinic
	FF Ribeiro Clinic
	Eersterust Clinic
	Lotus Garden Clinic
	Skinner Clinic
Kalafong Hospital	Gazankulu Clinic
	Phomolong Clinic
	Atteridgeville Clinic
	Bophelong Clinic
	Laudium Clinic

2. Self-Regulated Learning and Lifelong Learning Development

The BCMP program was designed to develop clinically competent practitioners who are willing to work in rural communities. Our aim is to create self-directed learners committed to lifelong learning. Self-regulated learning (SRL), central to this approach, involves students taking responsibility for identifying and addressing their own learning needs based on their clinical experiences. Lifelong learning refers to the ongoing pursuit of knowledge and skills throughout a professional's career, ensuring they remain up-to-date and effective in evolving healthcare environments.

Continuous access to educational resources is essential for SRL and lifelong learning to be effective. The equipment budget of Dirisana+ included Samsung tablets preloaded with clinical guidelines, e-books, interactive modules, and access to platforms such as Osmosis. These tablets provided students with immediate access to information, enabling them to apply theoretical knowledge to clinical practice in real-time. This technology not only supported self-directed learning but also reinforced students' commitment to lifelong learning by ensuring they had the tools needed to enhance their clinical competencies. Electronic tools assisted the learners in bridging the gap between theoretical knowledge and practical experience, and supported their ability to reflect on and to address knowledge gaps with their mentors in real-time.



3. Tracking Student Activity Through Electronic Logs

With over 230 students regularly entering clinical settings, tracking their activities and whereabouts is essential. With the use of Samsung tablets with internet access, the students were able to report to their mentors through daily electronic questionnaires, enabling effective monitoring of student activity across various clinical learning platforms. Students log their daily learning activities, including patient demographics, reasons for seeking care, biopsychosocial assessments, management plans, and any skilled procedures performed. This process tracked their activities but also supported medical record-keeping, a key objective of the program. From early 2022 to the end of the first semester in 2024, BCMP students logged data on 79,776 patient encounters, which provided comprehensive tracking and also valuable insights in the disease profile of rural clinics for ongoing curriculum improvements of the programme.



4. Data Utilization for Research and Assessment

The data collected from students' clinical activities has been utilized for research purposes. This research has been presented at conferences and has yielded the submission of several articles, one of which has already been published. As students continue to submit data, the research potential grows, offering further opportunities for scholarly work.

As outlined in the tables below, several articles have been submitted for publication, showcasing the research enabled by the grant through detailed analysis of BCMP students' clinical data and experiences (Table 2).

Table 2: Summary of Articles Produced Using Data and Transformation Enabled by the Grant

Article	Journal	Status
Diversity of patients logged by Clinical Associate students engaged in a Longitudinal integrated clerkship in four South African provinces in 2022: eLogbook data	South African Medical Journal	Under review
Assessing Clinical Associate Students' Views on Learning Opportunities and Involvement during Primary Health Care Placements: A Mixed Methods Study in Tshwane'	BMC Medical Education	Under review
Comparative Analysis of Clinical Associates Students' Training Experiences Across Diverse Hospitals in Gauteng and Mpumalanga	To be submitted to: The Journal of Physician Assistant Education	Final draft

The data collected by students also forms part of their learning portfolio and serves as a foundation for developing authentic assessments. Both formative and summative assessments are used. In addition to traditional tests and quizzes, students are evaluated through work-based assessments, such as bedside presentations, observed consultations, and professionalism. These assessments provide real-time feedback from healthcare workers, which helps students improve their skills. Faculty also track student performance and intervene early if any issues arise, thereby improving student throughput.

The data collected from an e-logbook significantly enhanced student education and outcomes in several ways:

1. **Real-Time Feedback:** The e-logbook allows for immediate documentation of clinical activities, including patient demographics, assessments, and management plans. This real-time reporting facilitates timely feedback from instructors and healthcare professionals, enabling students to quickly address any areas needing improvement.
2. **Authentic Assessment:** By incorporating work-based assessments such as bedside presentations and observed consultations, the e-logbook provides a more realistic evaluation of student skills. This approach ensures that assessments are closely aligned with actual clinical practice, offering a more accurate measure of student competencies.
3. **Comprehensive Tracking:** The e-logbook enables detailed tracking of each student's clinical experiences and performance. This comprehensive data collection helps identify patterns, strengths, and areas for development, allowing for targeted interventions and personalized support.
4. **Enhanced Learning Reflection:** Students can review their logged activities and feedback to reflect on their learning progress. This self-reflection supports self-regulated learning (SRL) by helping students recognize their learning needs and adjust their practice accordingly.
5. **Improved Accountability:** The electronic format of the logbook ensures that all data is systematically recorded and easily accessible. This not only enhances the accuracy and reliability of records but also holds students accountable for documenting their learning experiences and adhering to professional standards.
6. **Early Intervention:** Faculty can monitor student performance and identify issues early through the e-logbook. Early detection of challenges allows for timely intervention, which can prevent potential problems from escalating and supports better student outcomes.
7. **Streamlined Evaluation:** The e-logbook integrates various types of assessments and feedback into a single platform, streamlining the evaluation process. This efficiency helps ensure that assessments are conducted consistently and fairly, contributing to a more effective learning experience.



Overall, the e-logbook enhances the educational experience by providing valuable insights into student performance, fostering continuous improvement, and supporting a more robust and effective clinical training program for the BCMP group. Faculty also monitor student performance closely and intervene early if any issues arise, thereby enhancing student success and throughput.

One student, Ms Hlaka, during 2023, engaged with 326 patients and was involved with 225 skilled medical procedures. She participated in 1 114 hours of clinical training of which 402 was on call hours.

5. Data-Driven Curriculum Development and Standardization

The types of patients that students encounter are used in clinical scenarios for written tests and exams, including the Clinical Associate National Examination (CANE). Clinical associates are the only healthcare professionals in South Africa required to pass a national examination before being registered with the Health Professions Council of South Africa (HPCSA). The patient data collected helps ensure that the CANE exam is relevant to real-world clinical experiences. In the future, the data collected could be used to compare students' experiences with patients across the three universities (University of Pretoria, University of the Witwatersrand, Walter Sisulu University) offering the BCMP programme, helping to strengthen and standardize the training.

Furthermore, the data collected by BCMP students using tablets, obtained through the grant, has been instrumental in shaping the current curriculum review process, which aims to expand the programme to four years. This data has been crucial in identifying

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gaps within the existing curriculum and highlighting areas for potential revision or exclusion. As an example, the data showed minimal involvement by 2nd year BCMP students with paediatric patients. This gap will be addressed by allocating adequate time in the new four-year curriculum to paediatric rotations in the 2nd, 3rd and 4th years. By aligning with the South African disease profile and the activities performed at various healthcare levels, the data ensures that the BCMP programme remains relevant and responsive to the needs of the healthcare system, particularly within the District Health System. The data collected from students provides an opportunity for collaboration between the three universities offering the BCMP programme, especially when developing the exit examination (CANE). By using patient data to guide the exam content, the programme can ensure consistency across institutions and align the training of clinical associates with real-world healthcare needs.



6. Analyzing Patient Profiles and Disease Patterns

The collected data includes information about the South African disease profile and could be used to analyse differences and similarities between different urban and rural healthcare settings. The programme then has to ensure that students train in a variety of healthcare setting which will ensure adequate exposure to all the conditions prevalent in the South African disease profile. For example, data from 2023 shows that more patients with Hypertension and HIV infections are encountered in primary healthcare (PHC) clinics more than in hospitals. This finding underscores the importance of ensuring that students rotate at PHC clinics to gain exposure to these prevalent chronic conditions. As an example, in a paper currently under review for the South African Medical Journal, data collected by students using grant-funded tablets (as electronic logbooks) showed that of 12,147 patients, 26% had HIV, 26% had hypertension, 18% suffered trauma, 17% were pregnant, and 14% had diabetes mellitus, as shown in Figure 1.

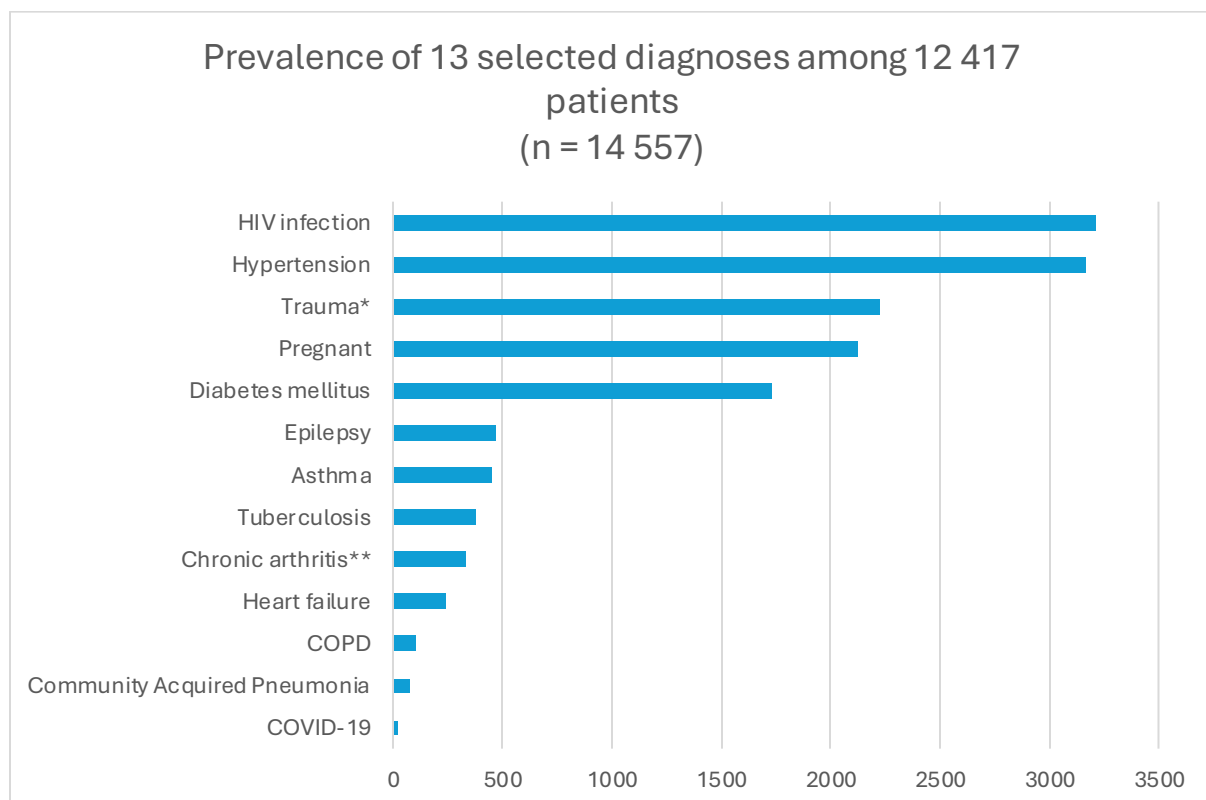


Figure 1: Example of diagnosis by BCMP students

7. The Future of Clinical Training Platforms

The data collected is also shaping the future of the clinical training platform for the upcoming four-year degree programme. This includes streamlining the curriculum content and refining the types of learning activities offered. As the data indicate in which facilities and in which sections of the facilities patients with certain diagnoses are encountered, clinical learning activities are then planned according to the facilities and the sections in the facilities to ensure students are exposed to an adequate variety of patients. The data could also be used in collaboration with other universities offering the BCMP programme or those considering offering it in the future.

8. Conclusion

In conclusion, the grant has been pivotal in expanding the BCMP program by incorporating diverse clinical settings and advanced technology. This support has enriched students' learning experiences, enabled real-time activity tracking, and significantly enhanced the program's relevance and responsiveness. The data collected has also been crucial for research and curriculum development, ensuring the program effectively meets current healthcare needs and evolves accordingly.