BQA NCQF QUALIFICATION TEMPLATE

SECTION A:	QUALIFICATION DETAILS		
QUALIFICATION DEVELOPER (S)	University Of Botswana		
TITLE	Master of Philosophy in Paediatric Infectious Diseases	**NCQF LEVEL**	9
STRANDS (where applicable)	N/A.		
FIELD	Health and Social Services	**CREDIT VALUE**	320
SUB FIELD	Health Science		

New Qualification	✓	Legacy Qualification		Renewal Qualification	
				Registration Code	

SUB-FRAMEWORK	General Education		TVET		Higher Education	✓									
QUALIFICATION TYPE	Certificate	I		II		III		IV		V		Diploma		Bachelor	
	Bachelor Honours		Post Graduate Certificate				Post Graduate Diploma								
	Masters	✓	Doctorate/ PhD												

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

The Master of Philosophy in Paediatric Infectious Diseases (MPhil Paed Inf Dis) is a subspecialty training qualification created with the goal of building a team of Batswana physicians with specialized knowledge in the diagnosis, evaluation, management, and prevention of infections affecting children. Although pharmacologic and technological advancements over the past century have led to dramatic decreases in the death rates attributable to infectious diseases, transmissible ailments remain a top cause of mortality among children globally.[1] In a recent systematic review of the global burden of disease during a 30-year period spanning the turn of the millennium, communicable illnesses

comprised 6 of the top 10 causes of disability for children less than 10 years of age.[2] Infectious diseases are, in many cases, preventable or treatable, but disproportionately affect marginalized communities and particular geographic areas due to maldistribution of physical and human resources. Thus, the training of infectious disease specialists capable of providing consultative, preventative, and treatment services in lower- and middle-income countries is one step in the direction of greater global health equity.

It is worth noting that while infections due to resistant organisms have been a growing problem globally, they affect low- and middle-income countries to a greater degree.[3] Recent evaluations of mortality data from Botswana show that deaths due to or associated with AMR ranked 5th out of all causes of death in 2019 – ahead of diabetes, kidney disease, violence, maternal/neonatal disorders, digestive disease, and chronic respiratory disease.[4] Children are not spared the impact: worldwide, 1 in 5 deaths due to AMR are in individuals <5 years of age.[5] A recent study of children of patients presenting to local hospitals and clinics in Botswana showed that 26% of individuals <18 years in the community were colonized with drug-resistant bacteria.[6] Regionally, recent outbreaks of multiply resistant bacterial and fungal infections in adult and paediatric facilities in Botswana and South Africa[7,8] have underscored the need for infectious diseases-trained specialists to develop of robust infection control programming and antibiotic stewardship measures, training for which would also be provided within a paediatric infectious diseases curriculum.

In Botswana, four of the top ten causes of death for all ages are communicable diseases, including lower respiratory infections and diarrheal illnesses, which disproportionately affect children under 5 years of age.[9] Human immunodeficiency virus (HIV) also continues to be particularly impactful; in 2020, despite noteworthy achievements in decreasing mother-to-child transmission,[10] there were an estimated 1400 new HIV infections in children aged 0-19 years of age.[11] Beyond being able to provide care for uninfected children suffering from infections, paediatric infectious diseases specialists would be well-trained in the care of patients with HIV and would be able to provide advice on the prevention of this devastating infection, both on individual and population levels.

In addition to individual health and population health equity, the establishment of a pathway for infectious disease specialization contributes to global health security. Previous studies have shown that antimicrobial stewardship interventions, which are generally overseen by infectious diseases specialists, result in more narrow-spectrum – as well as less overall – use of antimicrobial agents.[12] In parallel, hospital infection control programs, which also generally overseen by specialists in infectious diseases, help to prevent, identify, and mitigate outbreaks in the institutional milieu.[13] These efforts result not only in improved outcomes, lower mortality rates, and decreased costs for individual patients and the hospital system,[14,15] but also prevent the development of antimicrobial resistance (AMR), which threatens to be one of the greatest causes of loss of life and wellbeing in the modern age.[16] Given the ease with which resistant organisms may be transmitted from one community to another – as well as the limited pool of antimicrobials from which to choose – it is in all of our best interests to aid in the fight against this scourge.[17]

PURPOSE: (itemise exit level outcomes)

The purpose of this fellowship qualification is to produce experts in the field of paediatric infectious diseases (PID) who will serve as clinicians, researchers, leaders, educators, and antimicrobial stewards in Botswana, the region, and the international community.

The purpose of this qualification is to produce graduates with well-equipped with advanced knowledge, skills, and competences to:

1. Apply evidence-based clinical practice and research in paediatric infectious diseases to improve the health of children in Botswana.

2. Apply clinical leadership and training skills to guide clinical teams and hospital administrators using evidence-based principles to manage children with infectious diseases in Botswana and improve their overall treatment outcomes.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

1. NCQF Level 9 (Master of Medicine degree or specialty certification in Paediatrics & Adolescent Health or Paediatrics & Child Health or equivalent post graduate qualification)
2. The candidate must be registered or registerable with BHPC to be able to practice Medicine in Botswana.
3. Entry through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) is accessible to all candidates through institutional policies in line with the national RPL and CAT policies.

SECTION B	**QUALIFICATION SPECIFICATION**
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
1. Deliver compassionate consultative and primary care services in paediatric infectious diseases to improve the health of Botswana's children	1.1. Gather a history and perform a complete or targeted physical examination for children presenting with suspected infectious or parainfectious diseases in Botswana 1.2. Integrate knowledge of the epidemiology, transmission, clinical signs and symptoms, and methods of diagnosis of the most common infectious diseases and

	parainfectious diseases affecting children into patient evaluation 1.3. Examine how immunology concepts determine treatment recommendations, immunotherapies, prophylactic antimicrobials, and vaccination 1.4. Construct a reasonable differential diagnosis based on patient assessment and supportive data cognizant of the epidemiology of infectious diseases in Botswana 1.5. Advise consulting teams on the treatment of infectious and parainfectious diseases in children, including the role of source control 1.6. Propose appropriate laboratory assessment to determine the aetiology of a child's presumed infection or parainfectious syndrome (with an eye toward diagnostic stewardship) 1.7. Document a clinical evaluation appropriately in the medical record 1.8. Lead and work collaboratively within a team of physicians and allied professionals 1.9. Develop and apply ethical practice that respects patients, families, and coworkers
2. Investigate outbreaks, implement infection control programs, and advise colleagues, hospital administration, and the Botswana Ministry of Health on evidence-based strategies to prevent infections in children	2.1 Define terms of disease spread (including source, host, reservoir) and modes of transmission (including droplet, contact, airborne/aerosol, vehicle, vector, etc.) and give recommendations on appropriate isolation for suspected infectious disease based on these characteristics

	2.2 Characterize the roles of public health agencies at the local, regional, national, and international levels 2.3 Apply advanced techniques for sterilization and disinfection and be able to recommend appropriate use of each 2.4 Participate in an infection control investigation 2.5 Participate in infection prevention initiatives 2.6 Recommend appropriate preventive interventions for outbreaks of / exposures to infectious diseases 2.7 Demonstrate ability to review and contextualize vaccine data to manage children at risk of acquiring various infectious diseases and prevent morbidity and mortality 2.8 Identify vaccines included in the universal immunization program in Botswana and discuss why these vaccines and the current schedule were chosen 2.9 Articulate the drivers of vaccine hesitancy and its impact in the local and global contexts, and appraise strategies to mitigate this issue in communities
3. Critically appraise, develop, and carry out PID research to inform clinical care pathways and public health policy in Botswana and more broadly	3.1 Apply epidemiology and biostatistics concepts to clinical and research questions concerning complicated childhood infections in Botswana 3.2 Critically evaluate medical literature to determine its relevance in the local and global context

	3.3 Apply research skills to clinical questions concerning complicated childhood infections 3.4 Present / publish results of a research study on a paediatric infectious diseases topic
4. Lead antimicrobial stewardship efforts in their hospitals or units to improve outcomes, minimize unwanted secondary effects, and combat antimicrobial resistance	4.1 Identify and discuss the classes of antimicrobials and mechanisms of bacterial, viral, fungal, and parasite resistance 4.2 Articulate risks of antimicrobial overuse on individual and population levels 4.3 Discuss various stewardship models and their benefits and drawbacks with the target of developing a locally relevant antimicrobial stewardship program relevant to childhood infectious diseases epidemiology in Botswana 4.4 Identify and employ stewardship guidelines in patient care 4.5 Participate in a quality improvement project to enhance stewardship initiatives in the hospital or clinic 4.6 Identify areas for improvement in implementing antimicrobial stewardship programs and ways to overcome potential obstacles

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SECTION C	QUALIFICATION STRUCTURE				
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total Credits
		Level [ ]	Level [ ]	Level [9]	
FUNDAMENTAL COMPONENT Subjects/ Courses/ Modules/Units	Medical Microbiology I			*15*	*15*
	Introduction to Research Proposal Development & Grant Writing			*3*	*3*
	Introduction to Epidemiology & Biostatistics I			*3*	*3*
	Medical Microbiology II			*15*	*15*
	Epidemiology & Biostatistics II			*3*	*3*
	Medical Microbiology III			*15*	*15*
	Epidemiology & Biostatistics III			*3*	*3*
	Medical Microbiology IV			*14*	*14*
	SUBTOTAL				**71**
CORE COMPONENT	Introduction to Paediatric Infectious Diseases I			*48*	*48*

Subjects/Courses/ Modules/Units	Introduction to Paediatric Infectious Diseases Research I (MPhil Dissertation I)			*11*	*11*
	Introduction to Clinical Paediatric Infectious Diseases II			*41*	*41*
	Introduction to Paediatric Infectious Diseases Research II (MPhil Dissertation II)			*7*	*7*
	Infection Prevention & Control I			*7*	*7*
	Intermediate Clinical Paediatric Infectious Diseases			*32*	*32*
	Advanced Paediatric Infectious Diseases Research I (MPhil Dissertation III)			*16*	*16*
	Advanced Clinical Paediatric Infectious Diseases			*33*	*33*
	Infection Prevention & Control II			*7*	*7*
	Advanced Paediatric Infectious Diseases Research II (MPhil Dissertation II)			*16*	*16*

	Dissertation Presentation & Defence			*3*	*3*
	SUBTOTAL				***221***
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	**Credits Per Relevant NCQF Level**			**Total Credits**
		Level [ ]	**Level [ ]**	**Level [ ]**	
1.	**N/A**				
	N/A				
	N/A				
Electives					
	Learners will pick 4 of the below-listed elective courses to total 28 credits over 2 years of study. Elective courses have been organised into groups by areas of specialization in order to suggest experiences that may be helpful in the pursuit of common career paths within PID, but may be taken in any combination that a learner chooses in order to tailor their educational experience to their needs.				
1. Antimicrobial Stewardship	Experience in Antimicrobial Stewardship			7	7
	Drug Design & Development			7	7
2. Vaccinology & Immunology	Experience in Immunology			7	7
	Experience in Vaccinology			7	7

3.Public Health	Experience in Public Health			7	7
	Introduction to One Health			7	7
4. **Tropical Medicine & Zoonoses**	Parasitology Experience			7	7
	Introduction to Entomology			7	7
	Introduction to One Health			7	7
5.Immunocompromised PID	Experience in Immunology			7	7
	Experience in Infectious Diseases of Immunocompromised Hosts			7	7
6.Other	Infectious Diseases of Adults			7	7
	International Experience			7	7
SUBTOTAL (Comprised of 4 elective courses, taken over 2 years of study)					**28** (4 x 7 credits)
	SUBTOTAL (Comprised of 4 elective courses, taken over 2 years of study)				

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	**Credit Value**
9	*320*
TOTAL CREDITS	***320***

Rules of Combination:

(Please Indicate combinations for the different constituent components of the qualification)

Learners should gain a minimum of 320 credits to fulfil criteria of completion of training. The Master of Philosophy (Mphil) in Paediatric Infectious *Diseases* qualification is comprised of:

A. Fundamental courses: 71 credits

B. Core courses: 221 credits

C. Elective courses: 28 credits.
Learners will pick 4 of the available elective courses over their 2 years of study to total 28 credits.

TOTAL CREDITS: **320**

ASSESSMENT ARRANGEMENTS

Assessment will include both formative and summative modes. Assessment will be carried out by BQA-registered and accredited assessors or those accredited by other equivalent bodies.

1. **Formative Assessment**

Formative assessment will contribute 55 % to the overall grading for the qualification.

2. **Summative Assessment**

Summative assessment will contribute 45% of the overall grading for the qualification.

The candidates are expected to complete an MPhil thesis on their selected paediatric infectious diseases' topic which will undergo internal and external review for approval.

Both internal and external assessors shall hold a minimum Medical Doctorate degree (NCQF level 10) and subspecialty certification in Paediatric Infectious Diseases or a related field and should be registered with a recognized regulatory body.

MODERATION ARRANGEMENTS

There will be internal and external moderation as a quality assurance measure, in line with the policies of the Educational Training Provider.

Internal moderators must be suitably qualified in the field of Paediatric Infectious Diseases and be registered/registerable with the Botswana Health Professions Council and have BQA accreditation or any other recognized regulatory body.

External moderators are appointed for their teaching and disciplinary expertise and are subject to the approval by the institution. External moderators shall have a medical or doctoral degree with subspecialty certification in Paediatric Infectious Diseases or a related field, and register with a recognized regulatory body

RECOGNITION OF PRIOR LEARNING

Based on the Recognition of Prior Learning (RPL) Policy of the BQA, candidates may be granted exemption from applicable components of the qualification. This will be done in consultation with the institution's policies in alignment with national RPL policy.

CREDIT ACCUMULATION AND TRANSFER

A learner may transfer academic credits towards the award of the qualification as may be determined by the provider in line with institutional policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Candidates who have completed this qualification will be registrable with the Botswana Health Professions Council or equivalent to practice independently as Paediatric Infectious Diseases specialists. They can go into further horizontal or vertical pathways:

Horizontal articulation (NCQF Level 9)

- Master of Medicine in Clinical Microbiology
- Master of Medicine in Clinical Immunology
- Master of Medicine in Virology
- Master of Science in Biomedical Sciences
- Master of Science in Infectious Diseases
- Master of Science in Clinical Epidemiology
- Master of Public Health
- Master of Education in Health Professions Education

Vertical articulation (NCQF=10)

- Doctor of Philosophy (PhD) in Epidemiology
- Doctor of Philosophy in Preventive Medicine
- Doctor of Philosophy in Clinical and Translational Sciences
- Doctor of Philosophy in Infectious Diseases
- Doctor of Philosophy in Public Health
- Doctor of Philosophy in Health Professions Education

Employment

- Clinical Specialist in Paediatric Infectious Diseases
- Infection Control Specialist/Hospital Epidemiologist
- Antibiotic Stewardship Director
- Medical Researcher
- Hospital/Health System Administrator
- Advisor (medical board, international philanthropic board, pharmaceutical industry, insurance company, medical device developer, company board, etc.)

QUALIFICATION AWARD AND CERTIFICATION

Up on completion of all components of the qualification and achievement of 320 academic credits, the candidate will be awarded Master of Philosophy (MPhil) degree in Paediatric Infectious Diseases.

Certification

Candidates meeting the prescribed requirements will be awarded a certificate and academic transcript in accordance with the institutions' standards and applicable policies for awarding.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

Title of Qualification:

Qualification titles are similar across all countries assessed, varying only in whether the qualification is referred to as a subspecialty certificate, residency, or fellowship.

NQF Level & Credit Value/Duration:

All the qualifications are similar except for Canada and the U.S. The durations of qualifications vary from 2 years (in South Africa, Ethiopia, and Canada) to 3 years in United States (US).

Main Exit Outcomes:

Similarities: The exit outcomes of all qualifications are similar, focusing on medical expertise, communication, professionalism, leadership, scholarship, and advocacy, both at individual patient level and for the broader community. All qualifications also emphasize antimicrobial stewardship and infection prevention and control.

Differences: The North American qualifications are purely professional training and thus do not result in the conferment of additional degrees but do result in certificates or diplomas of completion of subspecialty training. The U.S. qualification also includes more infectious disease-specific outcomes while managing patients with complex problems like transplant medicine.

Domains/Modules/Courses:

Similarities: All qualifications offer emphasis on rotations through clinical service, ranging from 13 – 18 months duration.

Differences: The South African qualifications focused on microbiological capability (training in the microbiology lab) as compared to the other qualifications. The U.S., Canadian, and Ethiopian qualifications include rotations in adult infectious diseases as well as pediatric, whereas the South African qualification does not.

The South African qualification does not offer elective modules or dedicated research time. Both the U.S. and Canadian curricula highlight the importance of dedicated time on the immunocompromised infectious diseases service. Infection control rotations are explicitly required in the U.S., Canadian, and Ethiopian qualifications, with the South African qualification noting that exposure to infection

control will occur during the Microbiology rotations. Both Canadian and U.S. qualifications highlight separate antibiotic stewardship rotations, which are not discussed in the South African or Ethiopian qualifications. The Ethiopian qualification offers an epidemiology/biostatistics module. The Canadian qualification singles out public health as an important rotation, and others are not.

All qualifications have a research component except for the Ethiopian qualification.

There are no elective modules in the South African qualification while the other qualifications have provision for elective modules.

Assessment Strategies & Weightings:

Similarities: All qualifications include formative assessments such as case portfolios, clinical and oral examinations, written examination, progressive competency assessment approaches and laboratory work.

Differences: Assessments for the South African and Ethiopian qualifications involve written examinations at the end of training.

Rules & Minimum Standards:

Similarities: All qualifications have similar standards to each other, including completion of an accredited educational qualification and completion of a scholarly project.

Differences: The South African Paediatric Infectious Diseases qualification allows entry from the pathology/microbiology career path, unlike qualifications from other countries, which require entry from paediatrics. To fulfill the requirements for the certification in PID, the South African qualification requires that trainees complete the course of study, submit a clinical case log, pass the national examination (50% or higher mark), and publish or present a first-author paper or poster. The Ethiopian qualification requires completion of all courses and all sections passed with 75% or more. The Canadian qualification also requires registration as a pediatrician and successful completion of the certification examination in pediatric infectious diseases. While the U.S. qualification does not require completion of the national pediatric infectious diseases' examination or certification in pediatrics as prerequisites to obtain a qualification certificate, it does require successful completion of the national examination and certification as a general pediatrician to be certified by the American Board of Pediatrics as a pediatric infectious diseases' subspecialist and practice within this field. Both the US and Canadian qualifications require a scholarly project to be completed for the award of the qualification, though the Canadian qualification does not include dedicated research time like that of the U.S. qualification. The U.S. qualification requires that the scholarly project result in a written "work

product" – i.e., a published manuscript, well-reviewed grant proposal, progress report for a multiyear trial, or thesis/dissertation for an advanced degree (such as a master's or PhD) – whereas the Canadian qualification only requires completion of the Courses.

Education & Employment Pathways:

Similarities: There are no significant differences in education and employment opportunities between qualifications.

Educational pathways

Vertical pathway:

- Master of Medicine in Clinical Microbiology
- Master of Medicine in Clinical Immunology
- Master of Medicine in Virology
- Master of Science in Biomedical Sciences
- Master of Science in Infectious Diseases
- Master of Science in Clinical Epidemiology
- Master of Public Health
- Master of Education in Health Professions Education

Horizontal pathway:

- Doctor of Philosophy (PhD) in Epidemiology
- Doctor of Philosophy in Preventive Medicine
- Doctor of Philosophy in Clinical and Translational Sciences
- Doctor of Philosophy in Infectious Diseases
- Doctor of Philosophy in Public Health
- Doctor of Philosophy in Health Professions Education

Employment pathways

- Clinical Specialist in Paediatric Infectious Diseases
- Infection Control Specialist/Hospital Epidemiologist
- Antibiotic Stewardship Director
- Medical Researcher
- Hospital/Health System Administrator
- Medical Advisor (medical board, international philanthropic board, pharmaceutical industry, insurance company, medical device developer, company board, etc.)

REVIEW PERIOD

The qualification will be reviewed every 5 years starting from the date of approval.

For Official Use Only:

CODE (ID)			
REGISTRATION STATUS	**BQA DECISION NO.**	**REGISTRATION START DATE**	**REGISTRATION END DATE**
LAST DATE FOR ENROLMENT		**LAST DATE FOR ACHIEVEMENT**	