

Biobanks as a Strategic Pillar of Pakistan's Healthcare and Research Ecosystem

Editorial

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Biobanking has evolved beyond specimen storage into a strategic research infrastructure that integrates high-quality human biospecimens with clinical, demographic, genomic, and other health-related data. This integration supports biomarker discovery, understanding disease mechanisms, therapeutic development, precision medicine, and population health research. Its value was particularly evident during the COVID-19 pandemic, when well-characterized biospecimens facilitated research on disease pathogenesis, host responses, diagnostics, therapeutics, and vaccine development. More broadly, biobanks provide a foundation for longitudinal research, disease surveillance, and preparedness for emerging health threats. In Pakistan, they can also generate population-specific evidence to identify disease priorities and high-risk groups, informing more targeted and effective policies for prevention, healthcare planning, and public health.

Pakistan continues to face substantial gaps in longitudinal health data, representative biospecimens, standardized research infrastructure, and the translation of research into clinical practice. Fragmented research efforts and limited access to well-characterized specimens linked to clinical data constrain biomarker discovery, population-based research, precision medicine, and locally relevant innovation. Strategically developed biobanks can address these gaps by establishing ethically governed, quality-assured platforms for systematic specimen and data collection, enabling multicenter collaboration and research tailored to Pakistan's unique disease burden and population characteristics. Importantly, biobanking can transform specimens generated through routine healthcare into a sustainable national research resource, strengthening the country's capacity for evidence-based and precision healthcare.

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The establishment of the PKLI&RC Biobank represents a strategic realization of the institution's vision to integrate excellence in healthcare with prevention, research, innovation, and medical education. By linking high-quality biospecimens with clinical information, biobank will be directly



supporting PKLI&RC's research mission to promote cutting-edge research and bridge the gap between scientists and clinicians. Its development has been enabled by strong institutional leadership and a clear commitment to building research infrastructure as an integral component of excellence in healthcare. Qatar Biobank, an internationally recognized biobanking initiative, has established a valuable research collaboration with PKLI&RC, supporting knowledge exchange and capacity building in biobanking research. With robust governance, quality systems, and sustained institutional support, the PKLI&RC Biobank can become a national resource and a model for biobanking-led research capacity building in Pakistan, demonstrating how healthcare institutions can convert clinical resources into platforms for discovery, innovation, and improved patient care.

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