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Data Privacy, a key pillar in realizing ethical Open Science in resource constrained settings: Balancing Privacy, Protection and Accessibility

Bonface Ingumba[1]

[1]African Institution and Health Research Center, Nairobi, Kenya

Researchers in resource-constrained settings continue to face ethical challenges in collecting, using, and sharing data within Trusted Research and Data Environments (TRDEs). While open science promotes transparency, equity, and collaboration, it also heightens privacy concerns amid the rapid spread of artificial intelligence, big data, and machine learning. The African Population and Health Research Center (APHRC) is leading efforts to strengthen ethical data governance in Africa, focusing on how to protect privacy without restricting fair access to data. Growing risks such as data protectionism and restrictive monetization threaten cross-border collaboration and deepen inequalities across low- and middle-income countries (LMICs). APHRC's approach balances individual rights with collective benefits by treating privacy as both a safeguard and an enabler of open science. Guided by the principle that data is a public good, the Center aligns global frameworks—such as the AU Data Policy Framework, GDPR, and UNESCO's Open Science Recommendation, with regional instruments and practical innovations. These include the APHRC Central Data Catalogue, a secure repository governed by the Data Sharing Policy; improved metadata systems aligned with FAIR principles; a Data Governance Curriculum on the Virtual Learning Academy; the DASSA Platform supporting federated learning; and a low-code anonymization tool that simplifies privacy practices. Through these initiatives, APHRC demonstrates enhanced data visibility, capacity building, and trust while embedding methods such as k-anonymization, differential privacy and federated learning. This experience shows that context-sensitive governance rooted in CARE and FAIR principles can advance ethical, inclusive, and globally interoperable open science.

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