

Strengthening Health Systems by Integrating Health Care, Medical Education, and Research: University of Nairobi Experience

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Background: Lack and inequitable distribution of human resources for health (HRH) is a major health systems challenge in Sub-Saharan Africa.^{1,2} The Partnership for Innovative Medical Education for Kenya (PRIME-Kenya) is an innovative approach that seeks to strengthen health systems by increasing linkages and collaborations in health care, health education, and health research. This approach was informed by concerns of inadequate clinical exposure with increasing undergraduate student enrollment at a tertiary hospital; increasing demand for locally relevant health research; and the desire to retain health workers at nontertiary facilities during and after training.

Intervention: We focused on three interventions as part of the PRIME-Kenya initiative: decentralized training of undergraduate students, building research capacity at 14 nontertiary health facilities, and a nurse training program based on an eLearning platform.

- **Decentralized Training.** We sought to improve medical education capacity at selected nontertiary health facilities by training facility staff that already had postgraduate clinical training by using e-resources (textbooks, guidelines, and online lectures). Staff that completed the training were appointed as adjunct faculty at the University of Nairobi (UoN).
- **Building Research Capacity.** We conducted two phases of implementation science research training. First, between December 2012 and August 2013, 354 staff (30–60 per facility) received three days of instruction at their facilities on how to develop research questions, write research proposals, and collect data. Second, in October and November 2013, 35 adjunct faculty (3–5 per facility) received two additional

days of training during which they developed research proposals based on research questions developed during the first phase. These adjunct faculty will be mentored by UoN faculty to help them submit their proposals for ethics review, collect and analyze data, and disseminate results.

- **eLearning.** In 2012, the School of Nursing Sciences introduced an eLearning Bachelor of Nursing (eBScN) upgrading course for diploma-level nurses. Training is conducted in accredited county hospitals where students are supervised by UoN adjunct faculty.

Outcomes: At 14 nontertiary health facilities, 182 adjunct faculty have been trained and 306 students have rotated. Adjunct faculty at 9 health facilities have developed draft research proposals covering various areas including the impact of national health financing policies, staff retention, and quality of services. At 28 county hospitals, 148 students are enrolled in the eBScN program, and initial exam results indicate that trainees are gaining expected knowledge and skills.

Comment: According to the interviews, the students felt they had more opportunities to practice clinical skills, closer mentoring, and closer interactions with patients at the nontertiary facilities than at the tertiary hospital. Health workers at the nontertiary hospitals also reported improved quality of patient care, increased job satisfaction, and greater interest in research. Those working in the nontertiary health facilities prioritized research that was highly relevant to local practice and policy. In the eBScN training program, county hospitals have retained employees, and the nurses are upgrading their skills without losing income. This innovative approach is successfully addressing some of the HRH challenges in medical education, health care, and research.

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References

- 1 Mullan F, Frehywot S, Omaswa F, Buch E. Medical schools in sub-Saharan Africa. *Lancet*. 2011;377:1113–1121.
- 2 Chankova S, Muchiri S, Kombe G. Health workforce attrition in the public sector in Kenya: A look at the reasons. *Hum Resour Health*. 2009;7:58.