



Okoboi George Williams, microscopist in the PEN-Plus clinic at Atatur General Hospital in the Kumi District of Uganda, tests blood samples to screen children for sickle cell disease.

Selected PEN-Plus Publications

WHO/AFRO PEN-PLUS REGIONAL STRATEGY

Moeti M, Mocumbi A, Bukhman G. Why there is new hope for the care of chronic diseases in Africa. *BMJ* 2023;383:2382.

World Health Organization. *PEN-Plus – a regional strategy to address severe noncommunicable diseases at first-level Referral Health Facilities*. 2022.

World Health Organization. *WHO PEN and integrated outpatient care for severe, chronic NCDs at first referral hospitals in the African Region (PEN-Plus) – report on regional consultation (29 July – 1 August 2019)*. 2020. <https://www.afro.who.int/publications/who-pen-and-integrated-outpatient-care-severe-chronic-ncds-first-referral-hospitals>

VOICES FOR PEN-PLUS

Gomber A, Owino E, Echodu M, Gomanju A, Mategeko P, Brown L, et al. Embodied contradictions, structural power: Patient organizers in the movement for global health justice. *PLOS Global Public Health* 2023;3(11):e0002577. <https://doi.org/10.1371/journal.pgph.0002577>

Drown L, et al. Living with type 1 diabetes in Neno, Malawi: a qualitative study of self-management and experiences in care. *BMC Heal Serv Res* 2023;23:595.

Adler AJ, et al. Experience of living with type 1 diabetes in a low-income country: a qualitative study from Liberia. *BMJ Open* 2021;11:e049738.

PRIORITIZING SEVERE CHRONIC NCDS OF POVERTY

Gupta N, et al. Prioritizing health-sector interventions for noncommunicable diseases and injuries in low- and lower-middle income countries: National NCDI Poverty Commissions. *Global Heal Sci Pract* 2021. <https://doi:10.9745/ghsp-d-21-00035>

Bukhman G, et al. The Lancet NCDI Poverty Commission: bridging a gap in universal health coverage for the poorest billion. *Lancet* 2020;396:991–1044.

Coates MM, et al. Burden of non-communicable diseases from infectious causes in 2017: a modelling study. *Lancet Global Health* 2020. [doi:10.1016/s2214-109x\(20\)30358](https://doi.org/10.1016/s2214-109x(20)30358)

continued on page 2



Boudreaux C, et al. Noncommunicable disease (NCD) strategic plans in low- and lower-middle income sub-Saharan Africa: framing and policy response. *Global Health Action* 2020;13:1–19.

Binagwaho A, Muhimpundu MA, Bukhman G. 80 under 40 by 2020: an equity agenda for NCDs and injuries. *Lancet* 2014;383:3–4.

MONITORING AND EVALUATION OF PEN-PLUS

Adler AJ, Wroe EB, Atzori A, Bay N, Bekele W, Bhambhani VM, et al. Protocol for an evaluation of the initiation of an integrated longitudinal outpatient care model for severe chronic non-communicable diseases (PEN-Plus) at secondary care facilities (district hospitals) in 10 lower-income countries. *BMJ Open* 2024;14(1):e074182.

Boudreaux C, Salvi D, Adler AJ, Wroe EB, Coates MM, Olsen M, et al. Realigning noncommunicable disease monitoring with health systems priorities in the Africa region. *Health Promotion International* 2023;38(6).

Boudreaux C, et al. Addressing severe chronic NCDs across Africa: measuring demand for the Package of Essential Noncommunicable Disease Interventions-Plus (PEN-Plus). *Health Policy Plan* 2022;37:452–460.

WHO PEN AND PEN-PLUS

Wroe EB, Mailosi B, Price N, et al. Economic evaluation of integrated services for non-communicable diseases and HIV: costs and client outcomes in rural Malawi. *BMJ Open* 2022;12:e063701.

Ngoga G, et al. Outcomes of decentralizing hypertension care from district hospitals to health centers in Rwanda, 2013–2014. *Public Health Action* 2019;9:142–147.

Gupta, N. and Bukhman, G. Leveraging the lessons learned from HIV/AIDS for coordinated chronic care delivery in resource-poor settings. *Healthcare* 2015;3:215–220.

Wroe EB, et al. Leveraging HIV platforms to work toward comprehensive primary care in rural Malawi: the integrated chronic care clinic. *Healthcare* 2015. <http://dx.doi.org/10.1016/j.hjdsi.2015.08.002>

Bukhman G, Kidder A. *The Partners In Health Guide to Chronic Care Integration for Endemic Non-Communicable Diseases, Rwanda Edition*. Cardiac, Renal, Diabetes, Pulmonary, and Palliative Care. Boston: Partners In Health, 2011.

PEN-PLUS PARTNERSHIP AND NCDI POVERTY NETWORK

Bukhman G, et al. The PEN-Plus Partnership: addressing severe chronic non-communicable diseases among the poorest billion. *Lancet Diabetes Endocrinol* 2023;11:384–86.

Bukhman G, Mocumbi AO, et al. From a Lancet Commission to the NCDI Poverty Network: reaching the poorest billion through integration science. *Lancet* 2021;398: 22217–22220. [https://doi.org/10.1016/S0140-6736\(21\)02321-7](https://doi.org/10.1016/S0140-6736(21)02321-7)

continued on page 3



PEN-PLUS IMPLEMENTATION IN RWANDA AND MALAWI

Adler AJ, Randall T, Schwartz LN, Drown L, Matthews S, Pace LE, et al. What women want: a mixed-methods study of women's health priorities, preferences, and experiences in care in three Rwandan rural districts. *Int J Gynaecol Obstet* 2023;162(2):525–531.

Olds P, Kachimanga C, Talama G, Mailosi B, Ndarama E, Totten J, et al. Non-communicable disease burden among inpatients at a rural district hospital in Malawi. *Glob Health Res Policy* 2023;8(1):4.

Ruderman T, et al. Training mid-level providers to treat severe non-communicable diseases in Neno, Malawi through PEN-Plus strategies. *Ann Glob Health* 2022;88:69.

Niyonsenga SP, et al. Implementation outcomes of national decentralization of integrated outpatient services for severe non-communicable diseases to district hospitals in Rwanda. *Trop Med Int Health* 2021;26:953–961.

Eberly LA, et al. Cost of integrated chronic care for severe non-communicable diseases at district hospitals in rural Rwanda. *BMJ Global Health* 2019;4:1–7.

TYPE 1 DIABETES IN PEN-PLUS STRATEGIES

Ruderman T, Ferrari G, Valeta F, Boti M, Kumwenda K, Park PH, et al. Implementation of self-monitoring of blood glucose for patients with insulin-dependent diabetes at a rural non-communicable disease clinic in Neno, Malawi. *S Afr Med J* 2023;113(2):84–90.

Ruderman T, et al. Implementation of self-monitoring of blood glucose for patients with insulin-dependent diabetes at a rural non-communicable disease clinic in Neno, Malawi. *S Afr Med J* 2023;113:84–90.

Adler AJ, et al. Protocol for a feasibility randomised control trial for continuous glucose monitoring in patients with type 1 diabetes at first-level hospitals in rural Malawi. *BMJ Open* 2022;12:e052134.

Bukhman G, et al. Endemic diabetes in the world's poorest people. *Lancet Diabetes Endocrinol* 2015;3:402–403.

RHEUMATIC AND CONGENITAL HEART DISEASE IN PEN-PLUS STRATEGIES

Klassen SL, et al. Decentralization and integration of advanced cardiac care for the world's poorest billion through the PEN-Plus strategy for severe chronic non-communicable disease. *Global Heart* 2024;19(1): 33.

Coates MM, et al. An investment case for the prevention and management of rheumatic heart disease in the African Union 2021–30: a modelling study. *Lancet Global Health* 2021;9:e957–e966.

Eberly LA, et al. Nurse-driven echocardiography and management of heart failure at district hospitals in rural Rwanda. *Circ Cardiovasc Qual Outcomes* 2018;11:1–5.

SICKLE CELL DISEASE IN PEN-PLUS STRATEGIES

Drown L, Osei M, Thapa A, Boudreaux C, Archer N, Bukhman G, et al. Models of care for sickle cell disease in low-income and lower-middle-income countries: a scoping review. *Lancet Haematology* 2024. [https://doi.org/10.1016/S2352-3026\(24\)00007-3](https://doi.org/10.1016/S2352-3026(24)00007-3)

