

Demographic and Health Surveillance Systems: their relevance for universal health coverage and digital health research

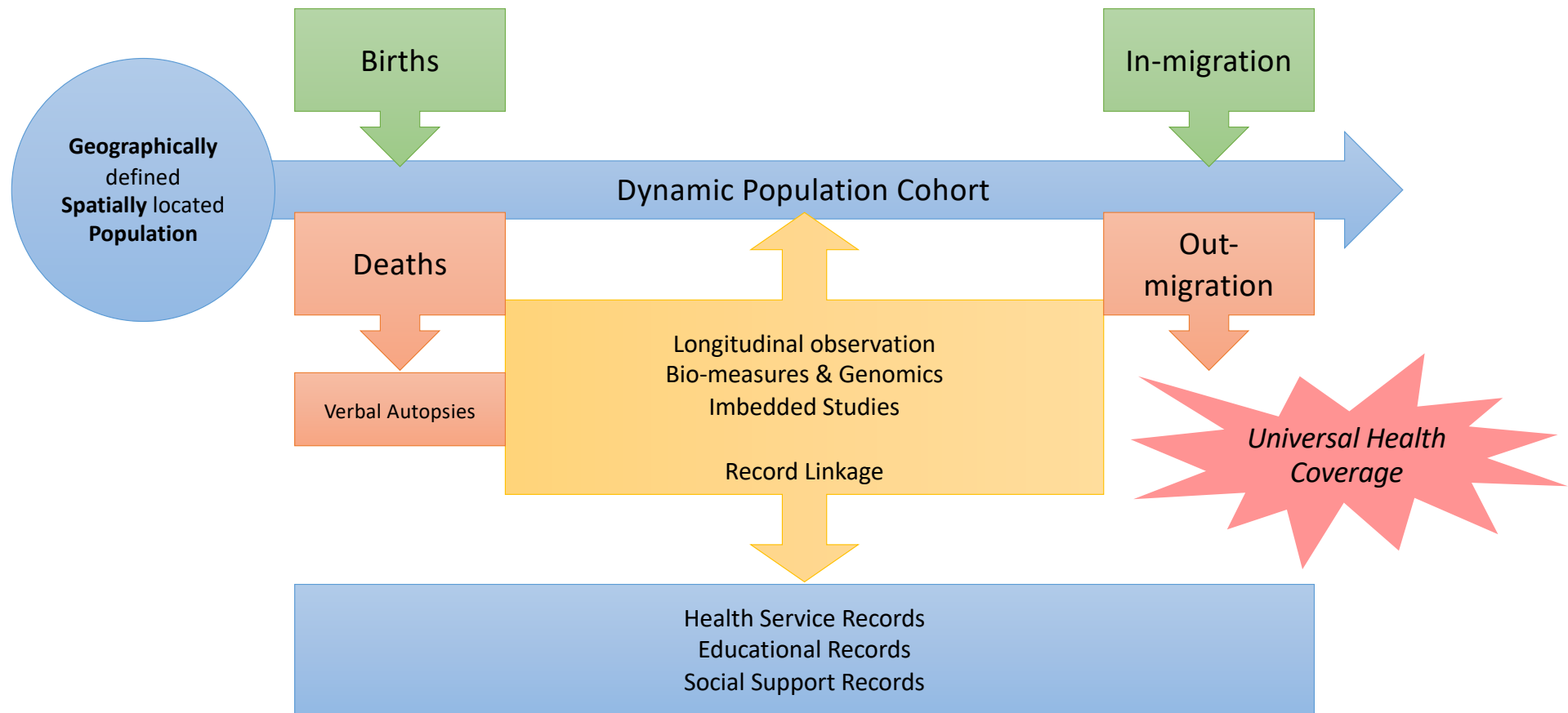
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Health and demographic surveillance systems (HDSS)



1. Tollman S. Community oriented primary care: origins, evolution, applications. *Social science & medicine*. **1991** Jan 1;32(6):633-42.
2. Ngom P, Binka FN, Phillips JF, Pence B, Macleod B. Demographic surveillance and health equity in sub-Saharan Africa. *Health Policy and Planning*. **2001** Dec 1;16(4):337-44.
3. Sankoh O, Byass P. The INDEPTH Network: filling vital gaps in global epidemiology. *International Journal of Epidemiology*. **2012**;41:579-88.
4. Herbst K, Law M, Geldsetzer P, Tanser F, Harling G, Bärnighausen T. Innovations in health and demographic surveillance systems to establish the causal impacts of HIV policies. *Current Opinion in HIV and AIDS*. **2015** Nov;10(6):483.



Community Oriented Primary Care



Pholela Community Health Centre, 1940



Emily and Sidney Kark

In the Karks Own Words

"we selected an area of homes overlooking the Umkomaas river, spread 6 to 8 miles (10-12kms) along the hillside slopes. The nearest homes were 1 or 2 miles (2-3kms) from the health centre."

"There was no existing map of the homes in the area nor was there any system of numbered addresses."

"...Using field compasses we located each homestead on the map, gave it an address and recorded the census of each family within it."

"(We explained) the purpose of introducing a health centre address system and our intention of doing a census of each family home"

"We were amazed how introducing an address and home census had defined the people as individuals and not merely as patients attending the clinic."

"When discussing the meaning of the term homestead...we found that there had been a change in family composition from earlier times. " In the first census (1942) 44% of

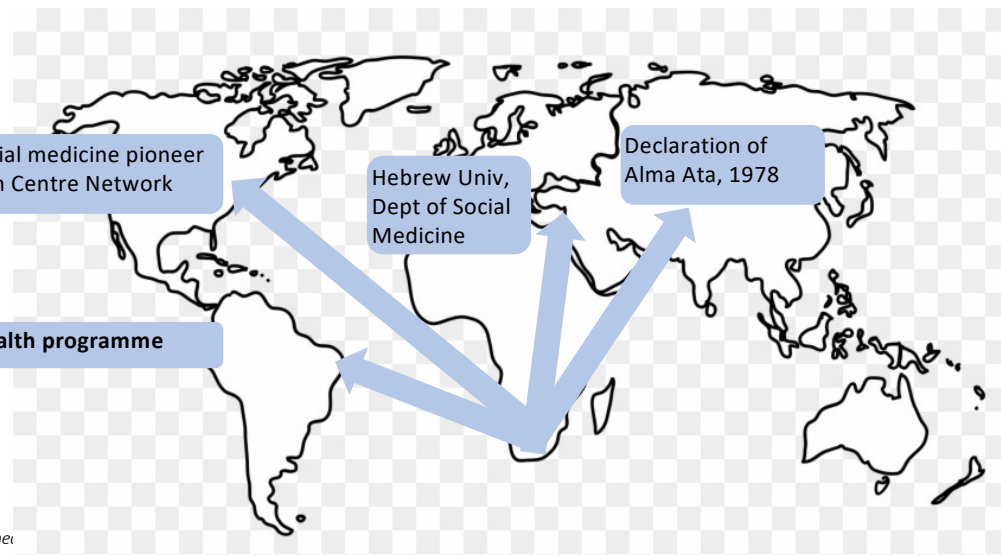
CHWs carried out a demographic survey, basic epidemiology and health education with each family. They also did periodic updates to record changes in the composition of households (births and deaths) as well activities (seasonal agriculture, marriages, migration patterns)

H Jack Geiger, social medicine pioneer
Community Health Centre Network

Hebrew Univ,
Dept of Social
Medicine

Declaration of
Alma Ata, 1978

Brazil's Family Health programme



1. Tollman S. Community oriented primary care: origins, evolution, applications. *Social science & medicine*
2. Marcus, T.S., 2014. *Community oriented primary care: Origins and history*. Minuteman Press.
3. [H. Jack Geiger, Doctor Who Fought Social Ills, Dies at 95 - The New York Times \(nytimes.com\)](https://www.nytimes.com/2014/05/18/us/hack-geiger-doctor-who-fought-social-ills-dies-at-95.html)
4. Longlett, S.K., Kruse, J.E. and Wesley, R.M., 2001. Community-oriented primary care: historical perspective. *The Journal of the American Board of Family Practice*, 14(1), pp.54-63.
5. Susser, M., 1999. Pioneering community-oriented primary care. *Bulletin of the World Health Organization*, 77(5), p.436.



HDSS Developments in Africa

Niakhhar Senegal (1962) recording reliable demographic and epidemiological data, in late 80s site for measles and pertussis vaccine trials, illustrating detrimental effect of high titre measles vaccine

Farafenni the Gambia (1981) established to evaluate a village-based primary care programme, later important site for malaria research

Navrongo Ghana (1992) Vit A supplementation reducing child mortality by 20%

Gwembe Zambia(1955) social impact of resettlement to create Lake Kariba

Butajira Ethiopia(1986) established to build capacity in epidemiological research

Masaka & Rakai Uganda(1990s) Epidemiology of HIV in Africa

APHRC Nairobi Kenya (2002) first urban HDSS, impact of slums on health outcomes of urban migrants

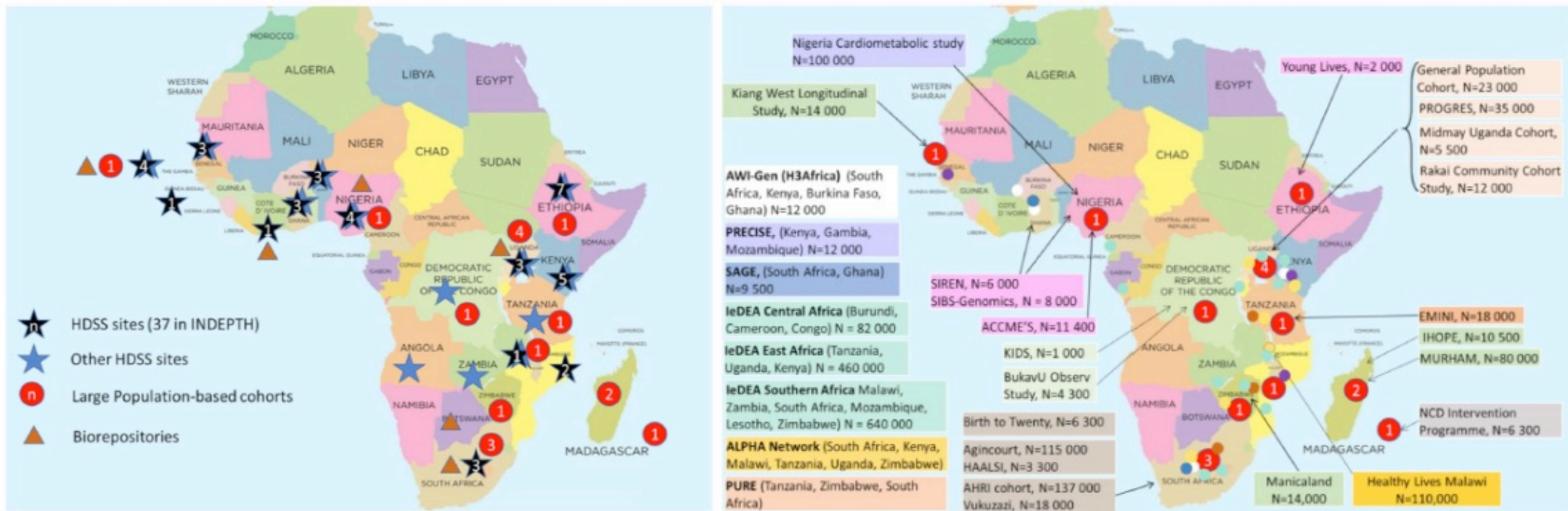
Ifakara Tanzania(1996) trial of the effectiveness of bed nets on morbidity and mortality of children, show 27% increase in survival

Karonga Malawi(1986) Tuberculosis epidemiology, first evidence of decline in population mortality due to introduction of ART

AHRI South Africa (2000) First evidence of increase in life expectancy due to ART introduction. Vukuzazi cohort showed superposition of chronic infections of TB and HIV with NCDs of hypertension and diabetes



Africa Population Cohorts

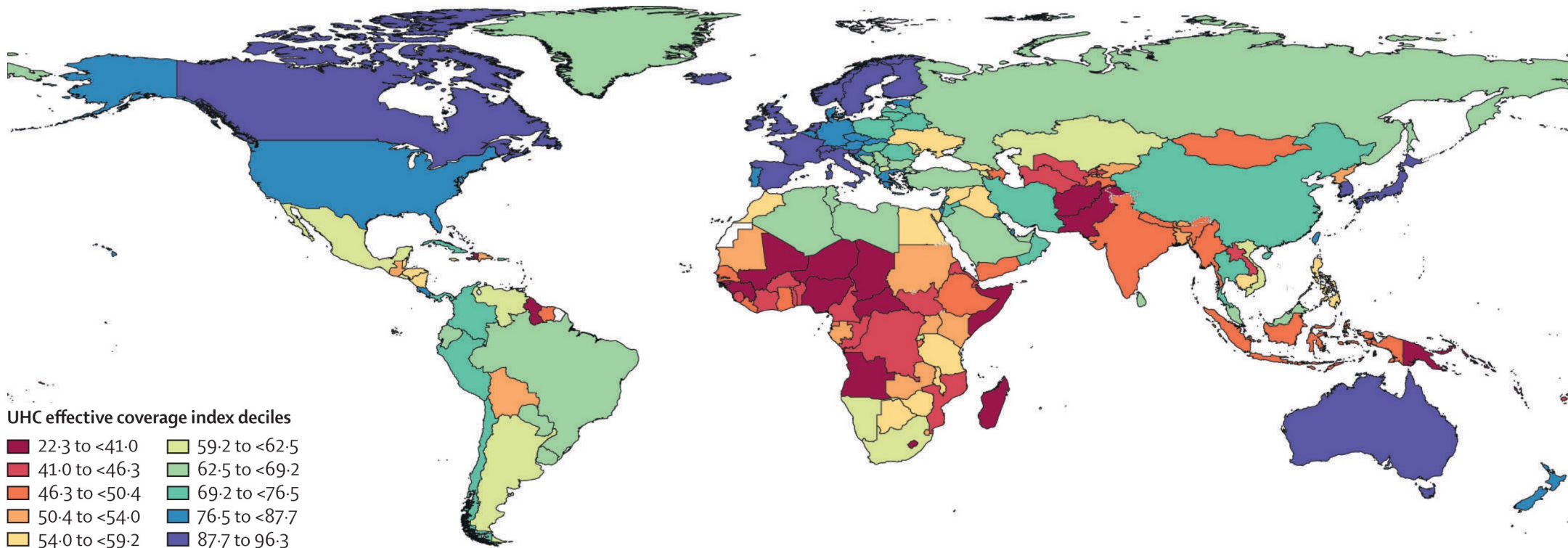


The Wellcome Trust. African Population Cohorts Consortium. London.

https://wellcome.org/sites/default/files/2021-03/APCC_Scoping_paper_FINAL_EN.pdf



UHC Effective Coverage



Collaborators GBDUHC. Measuring universal health coverage based on an index of effective coverage of health services in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2020;396(10258):1250-84. Epub 2020/08/31. doi: 10.1016/S0140-6736(20)30750-9. PubMed PMID: 32861314; PubMed Central PMCID: PMC7562819.



Relevance

- Add important dimension of those not contacting health services
- Host health system intervention studies using both traditional experimental as well as newer quasi-experimental designs
- Allow us to study multi-dimensional and multi-level factors impacting on UHC
- Form a base for a multi-disciplinary team working across traditional disciplinary boundaries
- Manageable population size to pilot and refine interventions before going to scale
- Longitudinal nature and geographic containment allow for meaningful community involvement and co-creation of interventions

