

Demographic Surveillance Sites and emerging challenges in international health

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At present, the long-term social, economic, and demographic impact of major diseases in developing countries can only be estimated using models since there are no empirical data on age and cause-specific morbidity and mortality. Reliable estimates require the input of accurate data into the models, from as many geographical zones as possible. With the collapse of vital registration systems and the rudimentary state of health information systems in most of the developing world, estimated projections are sometimes based on educated guesses and intuition rather than fact.¹ The investment needed to improve health information in these countries is unlikely to be made in the near future.

Strong national health research systems are needed to improve health. For developing countries to indigenize health research systems, it is essential to build capacity.^{2,3} A local cadre of research scientists is urgently needed, particularly in epidemiology, statistics, immunology, and the clinical sciences. Global disease control initiatives exist in countries where there are fewer than four epidemiologists and only one statistician. Training abroad has been an invaluable stopgap measure, but demand has consistently outstripped supply. The question remains: where is the next generation of research scientists in the developing world going to be trained?

One approach could be to strengthen sites that maintain Demographic Surveillance Systems (DSS). Demographic surveillance is the process of defining risk and corresponding dynamics in rates of birth, deaths, and migration in a population over time. Surveillance systems are often set up around specific intervention studies and later convert into standing DSS sites that can form a platform for further studies. There are over 30 DSS sites in Africa, Asia, and the Americas. At most sites, core demographic data are supplemented with social and economic

correlates of population and health dynamics.⁴ DSS sites have provided platforms for research on pneumococcal vaccines in Basse (Gambia), maternal mortality in Matlab (Bangladesh), non-communicable disease in Filabavi (Viet Nam), and HIV/STIs (sexually transmitted infections) in Rakai (Uganda), insecticide-treated nets in Navrongo, Farafeni (Gambia), Ifakara (United Republic of Tanzania), Kisumu (Kenya), and Oubritenga (Burkina Faso).

DSS sites attract professionals from diverse backgrounds. Highly-qualified demographers, epidemiologists, sociologists, clinicians, and economists enable a continuum of research and a multi-faceted examination of health problems and provide an ideal environment for training of research professionals. DSS sites in the Gambia, Navrongo in Ghana, Filabavi in Viet Nam, and Agincourt in South Africa, among others, serve as field sites for graduate students of international health.

DSS sites have come together under the banner of the INDEPTH Network, run by the developing countries with advice and financial input from developed countries. The collaboration has produced monographs on cause-specific mortality and model life tables.

However, project overcrowding can overload host communities, blur the outcome measures of projects, leading to inaccurate interpretations and conclusions. DSS sites could establish satellite field stations to spread the research load more evenly. Many DSS sites have developed a critical mass of faculty that should enable them to develop formal postgraduate training programmes for local research officers. Such initiatives might require establishing links with local universities. Good examples of this approach can be found in Agincourt in Johannesburg and the Africa Center in KwaZulu Natal.

Another challenge facing DSS sites is the accumulation of unanalysed

data. DSS data could be used to monitor trends in diseases and conditions — with the proviso that research done at a site had not influenced these trends. In particular, DSS sites have the capacity to help fill the data void in maternal and neonatal health, cause-specific mortalities, and noncommunicable diseases. It is incumbent on DSS sites to establish clear guidelines for data sharing and use. In return, individuals and institutions entrusted with DSS data need to attribute and acknowledge the data source, the researchers, the communities from which the data were obtained. As far as possible, data analysis should be conducted on site, and with the active involvement of a local analyst. In this way, local capacity for data analysis could be enhanced. DSS data could also be used to validate data collection instruments for monitoring disease control initiatives. The value of this approach has been demonstrated in validation studies on the sisterhood method for estimating maternal mortality in Matlab, Bangladesh⁵ and tools for the conduct of verbal autopsies in Morogoro in the United Republic of Tanzania⁶ and Agincourt, South Africa.⁷ The research agenda is shifting towards large-scale, multicentre trials and accelerated efforts at disease control. DSS sites have the potential to support such research by demonstrating versatility, fresh ideas, and new approaches. ■

Competing interests: Dr Baiden & Dr Hodgson work with the Navrongo Health Research Center, a Demographic Surveillance Site in Ghana. Professor Binka is the Executive Director of the International Network of field sites with continuous Demographic Evaluation of Populations and their Health (INDEPTH-Network).

References

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References

1. Cooper RS, Osotimehin B, Kaufman, Forrester T. Disease burden in sub-Saharan Africa: what should we conclude in the absence of data? *Lancet* 1998;351:208-10.
2. Nchinda TC. Research capacity strengthening in the South. *Soc Sci Med* 2002;54:1699-711.
3. Lansang MA, Dennis R. Building capacity in health research in the developing world. *Bull World Health Organ* 2004;82:764-70.
4. Binka FN, Ngom P, Phillips JF, Adazu KF, Macleod B. Assessing population dynamics in a rural African society: The Navrongo Demographic Surveillance System. *J Biosoc Sci* 1999;31:375-91.
5. Shahidullah M. The sisterhood method of estimating maternal mortality: the Matlab experience. *Stud Fam Plann* 1995;26:101-6.
6. Chandramohan D, Setel P, Quigley M. Effect of misclassification of causes of death in verbal autopsy: can it be adjusted? *Int J Epidemiol* 2001;30:509-14.
7. Kahn K, Tollman SM, Garenne M, Gear JS. Validation and application of verbal autopsies in a rural area of South Africa. *Trop Med Int Health* 2000;5:824-31.