External Review of the INDEPTH Network: Report to Sida and other funders

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Abstract

INDEPTH is a network of 37 health and demographic surveillance system (HDSS) sites based in the developing world that was set up by its members to raise their research productivity by sharing experience and skills and mounting multi-site research projects. This vision has proved relevant. INDEPTH has developed into a well-established network over the past decade and made effective progress toward these goals, but needs to continue to promote the conduct of more and better quality research using these HDSS data. This report suggests some changes to INDEPTH's structures and working procedures that should enable it to function more efficiently. It also identifies some challenges that the Network should address in order to enhance its achievements and further increase its scientific and policy impact.

Executive summary

Background

INDEPTH is a network of research centres running health and demographic surveillance systems (HDSS) that collect longitudinal data on geographically-defined populations in Africa, Asia and Oceania. The Network's objectives are to support its members to conduct health and demographic surveillance, develop their capacity to conduct research using these data, secure funding for and coordinate multi-site projects, and facilitate translation of INDEPTH's research findings into policy and practice. INDEPTH has grown rapidly from a founding membership of 17 sites in 1998 to a current membership of 37 HDSS sites and become arguably the most important network promoting demographic and health research in developing countries.

Sida/SAREC first began to support INDEPTH in 2002 and this review has been conducted as one condition of Sida's agreement to provide continuing support to the Network till 2012. Other agencies and research charities that support the Network will also make use of this report and so it covers the entire range of INDEPTH's activities.

The purpose of the review was to assess: (i) the achievements of INDEPTH since 2002 in relation to its stated mission, functional structures and operating environment; and (ii) the continued relevance of INDEPTH, including its mission, vision and strategies, considering the changes in its external environment in recent years. It was based on a review of INDEPTH's internal reports and published documents, on participation in INDEPTH's 2009 Annual General Meeting, and on interviews with stakeholders from both inside and outside the Network.

Organisational issues

During the past decade the INDEPTH Network has established itself as a credible Southern-led organisation able to coordinate an extensive programme of cross-site research and capacity development activities and to manage large budgets. This has enabled it to grow rapidly, to diversify its sources of funding, and to persuade nearly all active HDSS sites to join the Network. INDEPTH has benefited from strong leadership and, partly because of this, has been largely successful at managing the tensions that inevitably arise within any network that controls and distributes substantial funds.

Day-to-day management of the Network and coordination of its activities are undertaken by an Executive Director supported by secretariat with its headquarters in Accra, Ghana. The Executive Director reports to a Board of Trustees, comprising six site leaders elected by the Annual General Assembly of site leaders, two co-opted members representing external stakeholders, and a non-voting member – the person chairing the Network's Scientific Advisory Committee. At present, the Board elects its Chairperson from among its voting members. However, all elected Board members face a permanent potential conflict of interest between that of INDEPTH and that of their own site. We suggest that to deal with this, the Network appoints an independent Chairperson able to ensure the impartiality of the Board's discussions and decisions.

The secretariat was commended by nearly all the site leaders and staff that we interviewed for its effective organisation of the Network's activities. However, it remains fairly small for the current size of the Network and is perhaps over-stretched in certain of its activities. One potential threat to the Network is that the secretariat lacks a Deputy Director with the experience and authority to take on some of the Executive Director's quotidian workload and to provide overall leadership, in at least the short term, or to act in an ambassadorial role when necessary. It also urgently needs to fill the vacant post of Communications Manager. One option that INDEPTH should consider is to combine these two posts.

The secretariat's mechanisms for communicating with staff other than the leaders of member sites are not functioning effectively and it has also been only patchily successful at communicating the policy significance of its research to relevant national and international bodies. Thus, once the Communications Manger is in post, the secretariat should review both its internal and external communications processes, including its website. At present, the Network's communications occur entirely in English, which seems inappropriate for certain audiences.

The Scientific Advisory Committee (SAC) comprises scientists from outside the member sites. The responsibilities and operating procedures of the SAC and the mechanisms by which its advice is fed back to the Board and Executive Director need review. Appointments to the SAC provide the Network with an opportunity, which it could make better use of, to build more effective alliances with complementary scientific organisations and other external stakeholders.

Scientific activities

The raison d'etre of INDEPTH is to improve the amount, quality, and impact of the research conducted by member sites. To do this, INDEPTH and its members need to collect high-quality health and demographic surveillance data, analyse these data to produce important findings, and make standardised data series and datasets available to the wider scientific community. HDSS sites are exploiting their data more effectively than a decade ago and INDEPTH has played an important role in this both through its capacity-strengthening activities and by mounting cross-site studies. Nevertheless, more remains to be done to fully realise the potential of member sites' HDSS data for advancing scientific understanding and the formulation of health and development policy.

During the last decade INDEPTH has developed a series of resources that have effectively improved the ability of sites to conduct health and demographic surveillance. However, it is only now seeking to get to grips with an interrelated series of issues that are delaying the production of health statistics and preventing scientists in sites and elsewhere from maximising the analytic value of the data. These concern the creation of metadata, simplifying the extraction of rectangular analytic datasets from full HDSS databases, increasing the cross-site comparability of the analytic variables, and data sharing. The policy, intellectual property, technical, ethical and other issues involved are becoming so central to the future of INDEPTH and its member sites that we recommend that it establish a data administration committee to oversee the Network's efforts to develop policies on these matters; to improve its capabilities and information technology systems; and to establish a data repository.

Ultimately, the credibility of INDEPTH and the research that it generates depends on member sites being able to successfully collect high-quality health and demographic data. Thus, the Network should gradually assume a quality assurance role with regard to the HDSS data generated by its members. Eventually, membership of INDEPTH should represent a guarantee to the wider scientific world and to national and international agencies of the high quality of the information produced by a site's HDSS.

One area in which INDEPTH should strongly encourage all member sites to adopt standardised questionnaires and coding procedures is verbal autopsies and the determination of causes of death. The InterVA tool seems particularly suited to this purpose. Such data are a major strategic resource for health policy and planning. The Network could greatly enhance

its standing as a contributor to global health information systems by publishing comparable descriptive statistics on causes of death for large numbers of sites in a timely way.

INDEPTH has defined its mission and objectives and developed a series of strategic plans for the Network, but has yet to develop a clearly articulated *scientific* strategy. By definition, a HDSS generates longitudinal population-based demographic and cause-of-death data. Thus, INDEPTH should focus its resources on multi-site collaborations that take advantage of these characteristics of HDSS and, in particular, on research questions which are not amenable to investigation by other study designs. As a medium-term goal, INDEPTH should encourage member sites to make more use of these data for economic and social research that addresses development issues other than health that are targeted by the Millennium Development Goals.

INDEPTH's Annual General Meeting is a major event that absorbs considerable resources. Its scientific component needs revitalising with more site leaders and other senior scientists presenting papers. More of the papers presented should showcase research based on longitudinal analyses of members' population-based HDSS data.

The Network has been successful at stimulating and coordinating multi-site research studies through the mechanism of its Working Groups. Nevertheless, the data retrieval issues mentioned already, competing demands on people's time, and limited analytic capacity in participating sites have prevented some strategically important projects getting off the ground and mean that other Working Groups have failed to bring their work to the point of publication. While Working Groups should continue to be led and dominated by scientists from member sites, more of the Groups could benefit from the involvement of outside scientists with relevant expertise than do so at present.

We suggest that INDEPTH should focus its resources on research that fits in with the scientific strategy that we have suggested it develops. Sites should be free to establish Working Groups on any issue on which they want to work together. However, financial and administrative support should be concentrated on Working Groups addressing key research topics. While scientists from all member sites should have the opportunity to participate in Working Groups, leadership is crucial to a Working Group's success and needs to be made more attractive to strong potential leaders. Focusing its resources would allow INDEPTH to improve administrative support to Working Group leaders; to support participants with additional data analysis and writing up workshops; and to provide seed money to equip Working Groups that need them with dedicated post-doctoral research assistants.

The secretariat should seek to improve communication between the Working Groups and sites and, in particular, to address the complaint from sites that they are repeatedly faced with requests to produce tables and other outputs for Working Groups with unrealistically short deadlines. Existing written guidelines for Working Groups need to be expanded to codify institutional learning about effective working practices. All Working Group leaders and members should receive a formal letter of appointment clarifying what is expected of them and enclosing relevant procedural documents.

More Working Groups should publish their research in peer-reviewed journals and journal supplements. Such publications are more visible and more accessible than monographs and the opportunity to contribute to them is prized more highly by most scientists and site leaders.

Capacity building

The key advantage of INDEPTH is its potential to carry out multi-site demographic studies. However, this collective potential of the Network can only be realized if the member sites are appropriately organised and managed and able to reliably collect, manage, and analyse their data and generate high-quality publications. Importantly, producing data that are comparable across sites in order to facilitate cross-site studies necessitates some standardization of definitions and data collection and management procedures across the Network. Yet, at present, many member sites struggle to produce comparable demographic statistics and analyses from their data and this undermines their ability to contribute to and benefit from the Network. Thus, building capacity should remain a central objective of INDEPTH.

So far, INDEPTH has engaged, with considerable success, in an extensive programme of capacity strengthening among its member sites. The programme, which mainly involves conducting workshops to address specific and general deficiencies in data collection, management and analysis within the Network, is certainly valued by those participating and by their site leaders. Beyond improving individual sites' capacity, these activities have added to the ability of the Network to meet its other objectives such as conducting multi-site studies, as is evidenced by cross-site products such as the mortality monographs, whose generation was only possible after building the capacity of sites to contribute the required data. One area of capacity that may not have received sufficient attention so far is the sites' capacity to package their output appropriately for policy makers.

Perhaps due to lack of funding, this programme of activities has hitherto been somewhat reactive to specific needs at a given point in time and slightly haphazard. Apart from making it difficult for sites to synchronise their timetables with the capacity-building activities of the Network, this approach could potentially miss out some general capacity gaps. As such, INDEPTH should define a more strategic programme based on its short-, mid- and long-term needs and vision for capacity within the Network. This programme should be informed by the needs of member sites, at one level, and, at a higher level, strategically driven by the secretariat, Board and SAC. Such a programme will then guide the annual schedule of short courses and workshops and also the funding priorities for capacity strengthening.

While attempts to build up scientific leadership with sites through the University of the Witwatersrand Masters programmes and the INDEPTH fellows programme have had considerable success, the Network now needs to consider moving beyond Masters training to PhD and post doctoral training as a medium and long-term goal for building up scientific leadership within the sites. This needs to be organised within the context of a career framework in order to increase the chances of retaining the students after each stage. Not all sites have the capacity to provide high-quality supervision for PhD training; in such circumstances, students from weaker sites could be supervised jointly with a strong site.

There are a number of other capacity-building programmes beyond INDEPTH's own that could benefit member sites. The secretariat should try to keep a log of these programmes and encourage the sites to apply. An example of a particularly attractive, albeit very competitive, programme is the Wellcome Trust Masters Fellowship that funds a one-year taught course and then provides a further eighteen months of support to do research. The programme is specifically designed for students from developing countries and covers a wide range of disciplines, but with a slant towards public health and field research.

Finally, both natural growth of the Network and the proposal for strategically planned activities will lead to increased demand for efficient coordination of capacity-building activities. Currently most of the activities are organised by the Research Coordinator, who may become overstretched given the increasingly large programme of scientific activities that the Network is engaging in. Thus, the secretariat should consider recruiting someone either to be responsible for the work of coordinating capacity-building activities or to support the Research Coordinator in this.

External relationships

INDEPTH has helped to legitimise HDSS as a source of health research and information and this has encouraged the establishment of new HDSS in Africa and Asia during the past decade, which has fed back into growth of the Network itself. Although documentary evidence exists of the significant policy impact of some of INDEPTH's research, the Network has been less active at facilitating translation of its findings into policy and practice than it has at addressing its other objectives. The Network needs to further develop its reputation, and those of its members, as effective suppliers of high-quality health statistics able to inform health policy. It should put additional effort into developing relationships with international agencies other than the World Health Organization and develop links, and perhaps joint activities, with scientific networks and associations that have missions that relate to its own. At the national level, the Network should do more to assist those sites that do not have them to build strong relationships with stakeholders such as Ministries of Health, National Statistical Organisations, and local universities.

The secretariat also needs to actively manage its relationships with its funders in a more strategic and long-term way. As the different organisations funding INDEPTH have diverse and evolving missions, this would require the secretariat to monitor internal shifts in the policies of actual and potential funders and engage in ongoing discussions with each of them concerning the evolution of the Network's portfolio of activities and the potential future contribution that the funder might make to that portfolio. Each funding application should gain value from its integration into a more ambitious programme of activities.

These initiatives will require the attention of the Executive Director as well as the Communications Manager and should also involve members of the Network from outside the secretariat. Aspects of the process would probably benefit from obtaining outside advice from an organisation that specialises in communicating development research to policy makers.

Overall assessment

In relation to its own four strategic objectives, INDEPTH has been perhaps most successful at developing research capacity within member sites. Second, it has also done much to provide resources that improve the ability of sites to conduct health and demographic surveillance, with the notable exception that it is only now getting to grips seriously with the interrelated series of issues to do with data sharing, creation of metadata, simplifying the extraction of rectangular analytic datasets from full HDSS databases, and increasing the cross-site

comparability of the analytic variables. Third, while the Network has been reasonably successful at stimulating and coordinating multi-site research studies, the impact of this has sometimes been limited by insufficient analytic capacity in the participating sites. Finally, although the Network has done much to establish both its own credibility and that of health and demographic surveillance of localised populations over the last decade, it needs to build on this achievement by doing more in future to facilitate translation of its findings to maximise their impact on policy and practice.

The main recommendations of this review are listed on pages 55-58 of this report.

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List of acronyms

AGM	Annual General and Scientific Meeting
DSS	Demographic surveillance system
HDSS	Health and demographic surveillance system
INDEPTH	International Network for the Demographic Evaluation of Populations and their Health
INESS	INDEPTH Effectiveness and Safety Studies
InterVA	Interpreting Verbal Autopsies (a suite of public-domain computer models)
iShare	INDEPTH prototype data sharing project
MCTA	Malaria Clinical Trials Alliance
NGO	Non-governmental organization
PDA	Personal digital assistant (palmtop computer)
SAC	Scientific Advisory Committee
Sida	Swedish International Development Cooperation Agency
SWOT	Strengths, weaknesses, opportunities, threats

1. Introduction

1.1 Background to the review

INDEPTH is a network of research centres conducting health and demographic surveillance (HDSS) of geographically-defined populations in the developing world. Sida/SAREC first began to support the INDEPTH Network in 2002. Sida recently increased its core support to the Network to 10 million Swedish Kroner per year in an agreement that covers the period 2009-2012. It is Sida's policy to regularly evaluate organisations that it supports and this review has been conducted as one condition of Sida's current agreement to provide support to the INDEPTH Network.

Several other agencies and research funders also provide support to INDEPTH. To avoid duplication of effort, Sida/GLOBFORSK has consulted with these other funders on the terms of reference of this review so that the results of the evaluation can be used by all of them, rather than each organisation commissioning its own review. Moreover, INDEPTH's secretariat has indicated that it would also benefit from an external review that helps them to assess their performance and will feed into the Network's next strategic plan and intend to use this review for that purpose. Therefore, this review covers all of INDEPTH's activities, extending beyond those supported by Sida.

Equally, Sida commissioned an assessment of the financial and organisational aspects of INDEPTH in 2007, which reviewed issues relating to governance and to budgeting, accounting, internal control procedures, auditing and the associated legal obligations of the secretariat.[1] This review does devote some attention to organisational issues but, in line with both our terms of reference and own expertise, does not consider procedures for financial management of the Network in any detail.

1.2 Purpose of the review

The purpose of the review was to assess (i) the achievements (i.e. relevance, efficiency, effectiveness and impact) of INDEPTH in relation to its stated mission and functional structures and operating environment since 2002, and (ii) the continued relevance of

[1] Gutberg, C-G. (2007). *Financial and Organizational Assessment of the International Network of Field Sites with Continuous Demographic Evaluation of Populations and their Health in Developing Countries*. Report to Sida/SAREC.

INDEPTH, including its mission, vision and strategies, considering the changes in the external environment that have been taking place in recent years. The review was charged with making concrete and realistic recommendations regarding INDEPTH's future programme activities and interactions and its collaborations with other stakeholders in the area of health and demographic surveillance in developing countries. The full Terms of Reference for the review can be found in Annex 1.

INDEPTH is a network formed by HDSS sites to provide them with a service. It does not fund the sites' core activities. Thus, the aim of this review was primarily to assess the INDEPTH's effect on the sites, not the effects or effectiveness of the sites. Of course, INDEPTH achieves much of its wider impact via its member sites, but what this review focuses on is not the overall impact of the sites' research activities, but the extent to which that impact has resulted from the activities of INDEPTH.

INDEPTH has not until now operated within a detailed log frame or developed quantitative, time-limited indicators of progress toward its objectives against which it could be reviewed. Arguably, developing such indicators is neither feasible nor desirable, though we welcome INDEPTH's current initiative to develop metrics for the different entities in the Network that will provide a basis for monitoring at least its activities and outputs and their immediate effects. Thus, the review assessed the effectiveness and impact of the Network primarily against its four principal strategic objectives (these are listed in Section 2.2).

The report is structured around four primary themes:

1. Organisational and governance issues: the roles of and interrelationships between the Network's various structural components, including the secretariat, and their relations with member sites.
2. Scientific activities: direction, co-ordination and support for scientific activities within the Network, and the relevance, effectiveness, and impact of those activities.
3. Capacity-strengthening activities: organisation and support by the secretariat for the activities, the objective of and rationale for the activities, and their impact on the participants, sites and the Network in general.
4. Relationships between INDEPTH and other stakeholders such as universities and other research institutions in both resource-poor and developed countries, health-related governmental and non-governmental bodies, and international agencies.

These four thematic areas were evaluated on the basis of a review of documents, observing activities and interviewing stakeholders (see Annex 2 for a detailed description of the methods used to undertake the review).

1.3 Structure of the report

This report is divided into seven sections. The section following this introductory one describes the INDEPTH Network. The next four sections are based on the thematic areas around which the review was conducted i.e. organisational and governance issues, scientific activities, capacity-strengthening activities, and relationships with other stakeholders. (Annex 3 lists INDEPTH's recent activities and outputs). The penultimate section of the report presents an overall assessment of the strengths and weaknesses of, and opportunities and threats facing, the Network. The report's final section summarises the recommendations arising from the review. In the four central sections, each theme is described with respect to process, product, impact and the views of various stakeholders before conclusions and recommendations about process and outputs are presented.

2. INDEPTH Network

2.1 History

INDEPTH, or the International Network for the Demographic Evaluation of Populations and their Health, is a network of 37 member organisations that run health and demographic surveillance system (HDSS) sites located in developing countries. All the sites are located in Africa and Asia except for one in Papua New Guinea (see Annex 3.1 for a list of the sites). Demographic surveillance minimally entails the longitudinal monitoring of the population of a geographically-defined area, enumerating all individuals in the population and obtaining basic information on them (i.e. their age and sex); recording all births, moves and deaths in this population. It usually involves collecting information on causes of death. In total, INDEPTH member sites conduct continuous demographic surveillance on over two million people.

INDEPTH was born out of a series of meetings funded by the Rockefeller Foundation in 1997 and 1998 between demographers and other research scientists from institutions including the University of the Witwatersrand, the Ghanaian HDSS site at Navrongo, the London School of Hygiene & Tropical Medicine, and Heidelberg University. During these meetings it became clear that a network was needed to enable existing HDSS sites to share experience and expertise and to facilitate multi-site comparative demographic research.

INDEPTH was formally constituted in 1998 at a meeting in Dar es Salaam, Tanzania and subsequently held its first Annual General Meeting in 2000 in Johannesburg. The first strategic plan for the Network was developed in 2001 and adopted in 2002 at INDEPTH's second Annual General Meeting in Addis Ababa.

INDEPTH's annual expenditure (US$)	
2001	913,947
2002	874,534
2003	1,312,698
2004	2,308,576
2005	1,486,624
2006	4,364,110
2007	4,909,721
2008	9,442,265

Source: Annual audited financial statements

Between its foundation a decade earlier and 2009 INDEPTH grew rapidly from a founding membership of 17 sites to its current membership of 37 HDSS sites and to become arguably the most important network promoting demographic and health research in developing countries. Nearly all eligible HDSS sites have now opted to join INDEPTH. The Network's expenditure in 2008 was US$9.4 million, up from US$1.5 million in 2005.

The formation of INDEPTH was predicated on the idea that HDSS have an important role in providing high-quality, longitudinal health and demographic data, particularly in contexts where national vital statistics are either lacking or seriously compromised in quality, and on the potential for harnessing the collective capacity of multiple HDSS sites through a network. INDEPTH recognizes that networking provides a mechanism for enhancing the output of individual sites through exchange of experiences and expertise and that of the sites collectively through multi-site research collaborations. Furthermore, as part of a network, member sites should gain more visibility and influence on the global health scene than they would have independently.

Countries with Demographic Surveillance System (DSS) Field Sites participating in the INDEPTH Network

2.2 Aims and objectives of the INDEPTH Network

INDEPTH describes its vision as to be an international platform of sentinel demographic sites that provides health and demographic data and research to enable developing countries to set health priorities and policies based on longitudinal evidence. INDEPTH's data and research will guide the cost-effective use of tools, interventions and systems to ensure and monitor progress.

INDEPTH's stated mission is to harness the collective potential of the world's community-based longitudinal demographic surveillance initiatives in resource constrained countries to provide a better, empirical understanding of health and social issues, and to apply this understanding to alleviate the most severe health and social challenges.

The strategic objectives of the Network are:

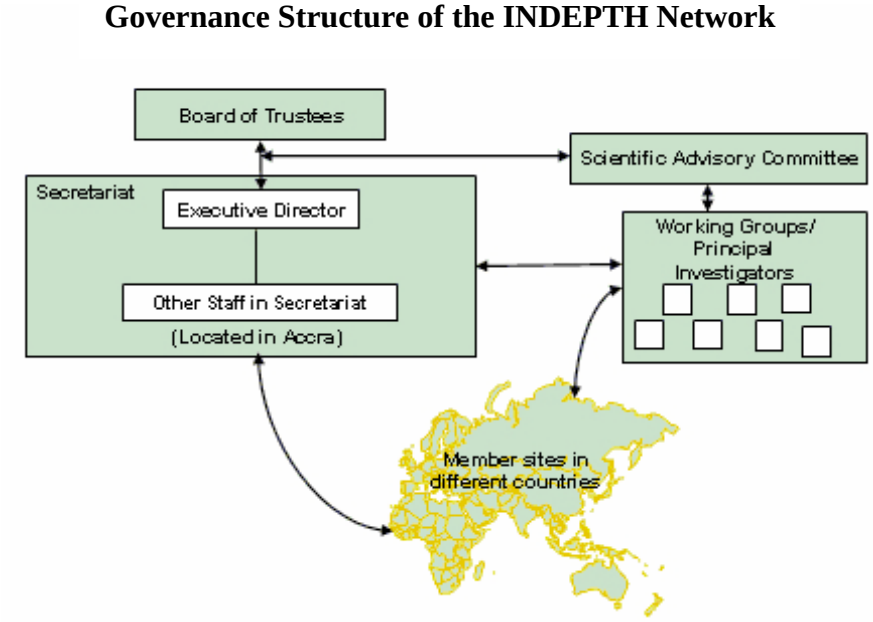
1. To support and strengthen the ability of INDEPTH sites to conduct longitudinal health and demographic studies in defined populations
2. To facilitate the translation of INDEPTH findings to maximize impact on policy and practice
3. To facilitate and support research capability strengthening relevant to INDEPTH activities
4. To stimulate and co-ordinate multi-site applications to research funding bodies for specific research activities.

3. Organisational issues

3.1 Organisation of INDEPTH

The INDEPTH Network is registered as a not-for-profit company in Ghana. Its organisational entities and procedures are designed to meet the legal requirements imposed on such companies. They seem largely appropriate for a scientific network employing a moderately-sized secretariat with an annual budget in the region of US$10 million a year. Its governance structure has four main bodies: the General Assembly of the Network's members, the Board of Trustees (described legally as the Executive Council), the secretariat, and the Scientific Advisory Committee (SAC). A discussion follows of each of these entities and its role within the Network.

Governance Structure of the INDEPTH Network



3.2 The General Assembly

The General Assembly of the INDEPTH Network comprises the leaders of sites that are full members of the Network or their nominated representatives. Each member site has one vote. The General Assembly is usually held as part of the Network's Annual General Meeting. It receives reports from the Board and secretariat and the Network's annual accounts in open session. In closed session, it elects members of the Board and discusses and votes on constitutional and other matters on which it is consulted by the Board, including criteria for membership of the Network.

These arrangements place ultimate control of the Network in the hands of the member sites, giving the existing site leaders the power to determine the requirements for membership of the Network and other constitutional matters and to elect the majority of voting Board members from among their number.

3.3 The Board of Trustees

The Board of Trustees (or Executive Council) provides oversight and accountability for the activities of the secretariat and of the Network as a whole. It appoints the Executive Director of the INDEPTH Network. The Board has eight voting members, six elected HDSS site leaders and two co-opted independent members, who represent the funding agencies and other external stakeholders. The chairperson and the vice chairperson of the Board are elected from among these voting members of the Board. The Executive Director and the chairperson of the SAC are ex-officio non-voting members of the Board and the Network's lawyer acts as its Secretary. The Board meets at least once a year, often immediately before the start of the Annual General Meeting.

Issues to consider

Only six sites are represented on the Board at any point in time, which is a small proportion of the Network's membership. Both the Chairperson and Vice-Chair of the Board are elected from among its voting members and, in practice, the positions have always been held by site leaders. As INDEPTH is a network of sites, it is appropriate that the Board should be controlled by the member sites. Equally, and without wishing to imply any criticism of current or previous Board members, elected Board members face a permanent potential conflict of interest between that of INDEPTH and that of their own site. This conflict of interest is potentially most severe for the Board's Chair, who has particular responsibilities for liaison with donors, oversight of the secretariat, and INDEPTH's portfolio of research.

Recommendations

The Network should consider appointing an independent Chair of the Board from outside the Network. This would serve to ensure not only that the Chairperson is seen to be impartial but also, just as importantly, that he or she could use the Chair's authority to ensure and guarantee the impartiality of the discussions and decisions of the Board as a whole.

In seeking to appoint an outsider to its most senior position, the Network could hope to attract a widely respected individual who would be able to act effectively for it in an ambassadorial role. One option might be to appoint independent Board members to both the Chair and Vice-

Chair's positions with overlapping terms of service, for example with each individual serving first for two years as the Vice-Chairperson and then for two years in the Chairperson's role.

3.4 The secretariat

The secretariat is charged with the day-to-day management of the Network and the co-ordination of its activities under the direction of the Board. Currently the core secretariat is based in Accra, Ghana. The responsibilities of secretariat include: coordinating and supporting the conduct of cross-site activities; organizing meetings of the Board, SAC and the General Assembly; fundraising for network-level studies; packaging and disseminating the findings of research done by the Network; and promoting INDEPTH and its activities among regional and global institutions. The secretariat also works with SAC to identify key health and demographic issues that have the potential to be addressed by INDEPTH.

The secretariat is headed by an Executive Director who reports directly to the Board. The position is currently held by Dr. Osman Sankoh. Other key positions in the secretariat include the Scientific Research Co-ordinator, the Information Systems Manager, the Communications and External Relations Manager, and the Finance Manager.

For some particularly large INDEPTH projects, separate coordinating bodies have been constituted to maximize efficiency and avoid overloading the central secretariat. These satellite secretariats are sometimes located outside Ghana and operate in a semi-autonomous manner on a day-to-day basis, but remain under the overall authority of the Executive Director. Currently there are four satellite offices: at the University of the Witwatersrand, Johannesburg, South Africa, supporting the Adult Health and Aging Working Group; in Nairobi, Kenya, supporting the MCTA Project; at Mahidol University, Bangkok, Thailand, supporting the Sexual Reproductive Health Working Group; and in Dar es Salaam, Tanzania office, supporting the INESS Project.

Between the inception of the Network and 2005 the secretariat had a core staff of six, the Executive Director, the Administrative Officer, the Information Systems Manager, the Communications and External Relations Officer, and the Accountant, all assisted by an administrative secretary. However, the secretariat of INDEPTH has grown substantially in size in the last few years, largely as in response to the rapid growth of the Network with the funding of the MCTA and INESS projects by the Bill and Melinda Gates Foundation. Currently the core secretariat comprises 15 staff, while MCTA and INESS have secretariats of

5 and 6 staff respectively. Many of the key staff are long-standing employees of the Network who have progressed from having sole responsibility for some aspect of the secretariat's work (e.g. scientific coordination, finance, etc.) to managing a small staff. In addition, posts have been created with responsibility for scientific coordination, grants administration, and the administration of large projects.

The performance of the secretariat is rated fairly highly within the Network. Site leaders completed a questionnaire in October 2009 as part of a process to develop performance metrics for the secretariat. Their responses were generally positive. The secretariat was rated most highly for its capacity development activities and least highly for dissemination of the Network's research findings to scientific audiences and policy makers. Individual members of staff from member sites who have participated in Network activities such as the Annual General Meeting or training workshops are almost unanimous in their praise for the secretariat's efficiency at making logistical arrangements.

The transition in leadership between the previous and current Executive Directors has been completed without any major disruptions in the staffing or functioning of the secretariat. Our interviews with a range of senior individuals involved in INDEPTH, including members of the Board and site leaders, indicate that the new Executive Director has succeeded in gaining the confidence of the leadership of the Network. In our view, the secretariat has benefited from strong leadership since the founding of INDEPTH and continues to do so.

Issues to consider

As with many networks, the function of the secretariat lies somewhere between that of research coordination, with practically no scientific initiative coming from it, and, at the opposite extreme, taking over direction of the Network and its activities. Many site leaders strongly favour keeping the secretariat relatively small and limiting its functions to research coordination. In general, their perception and that of most other stakeholders is that the secretariat has fairly efficiently fulfilled its mandate as a co-coordinating body for the Network.

The case for keeping the secretariat small and arguing that it should restrict itself to research coordination is arguably less clear cut than most of the Board and site leaders believe given the high proportion of INDEPTH's funding that is raised centrally, as opposed to by Working Groups. While control of INDEPTH does need to remain with sites, the secretariat needs to be

adequately staffed and have the scientific experience and authority to fundraise successfully. One issue with the recent unsuccessful bid to the Wellcome Trust for major funding may have been the diffuse nature of the leadership of the proposal, with no one individual having clear cut responsibility for articulating the scientific justification for the work, for guaranteeing delivery of the outputs, and for ensuring the primacy of the Network's interests in its relationship with its northern partners.

In our view, the secretariat remains fairly small for the current size of the Network and is perhaps over-stretched in certain of its activities. It only employs one person with an exclusively scientific remit. Its effectiveness could be improved in several specific respects, though in most cases additional staff with the necessary skills would be required to do so. The Executive Director has identified many of these problems already and is working to rectify them.

One potential threat to the Network is that the secretariat lacks a Deputy Director with the experience and authority to take on some of the Executive Director's quotidian workload and to provide overall leadership in at least the short term or to act in an ambassadorial role if, for example, the Executive Director resigned or became ill. Lack of a Deputy increases the administrative and managerial workload of the Executive Director, to the detriment of his more strategic and ambassadorial functions. In day-to-day terms, it can leave him with irresolvable diary conflicts and requires him to manage the Accra office at a distance when he is travelling.

To act in the Director's role requires not just managerial skills but a good grasp of the Network's scientific agenda and the international health scene in order to communicate effectively with site leaders and other senior scientists and with scientific and policy advisers to governments, international organisations and funding agencies. Thus, in practice, the secretariat's Research Coordination Manager is often called on to deputize for the Executive Director. However, such *ad hoc* arrangements always tend to burden the individual concerned with responsibilities, without giving them the authority to fulfil them.

Moreover, the role of the Research Coordinator is in itself a demanding and time-consuming one, without adding additional managerial responsibilities to the job description, particularly as the Research Coordinator also takes responsibility for the scientific content of the Network's programme of training workshops as well as sometimes delivering training

himself. Thus, the Coordinator is already at the risk of being overstretched. Balancing between the day-to-day coordination of ongoing scientific and training activities and working with SAC and site leaders in the development of new activities leaves the Research Coordinator with little time for strategic thinking. As such, INDEPTH should consider either providing him with more assistance or recruiting a Capacity-building Coordinator to work alongside the Research Coordinator.

Both the October 2009 survey of site leaders and our own interviews indicate that sites would welcome the assistance of the INDEPTH secretariat not just with data processing and analysis but with fund raising, with communicating their research to a range of audiences, and with a range of managerial and administrative matters. In our view, such expectations imply an expansion of the functions of the Network than is neither desirable nor feasible. It is the secretariat's responsibility to seek funding for Network activities and to disseminate the findings of research conducted by the Network. We discuss these activities in section 6 of the report. However, the secretariat should not be expected to raise funds for or disseminate the results of site-specific activities. They do have an important role in developing sites' own capacity in any area in which they share common needs. These issues include not just those relating to the conduct of scientific research but also to most other activities in which sites are engaged, including communication with government departments and research institutions. Such capacity development activities might include training in proposal writing but probably should not extend routinely to helping site staff to develop particular proposals for research at their own sites.

One area in which the secretariat's performance could improve is internal communications. Funnelling communications from sites to the secretariat via site leaders enables the latter to manage their staff properly and prevents the secretariat's time being wasted by junior staff making requests to participate in Network activities when this would not be approved by their managers. The case for channelling communications from the secretariat to site staff via site leaders in the same way is less clear cut. It can both add to the workload of site leaders and cause communication bottlenecks.

One specific communication issue is that the secretariat is entirely English-speaking and none are proficient in either French or Portuguese although the Network includes sites from francophone and lusophone countries. While it would probably be infeasible as well as prohibitively expensive for INDEPTH to adopt multiple working languages, language is an

obstacle to communication, especially with the more junior staff from sites in non-English speaking countries.

The INDEPTH website represents an important resource both for staff of member sites and for outsiders interested in finding out about the Network and its research. While reasonably easy to navigate, it is has a rather cluttered look and suffers from broken links and outdated "current content". Although a series of Discussion Boards exists on the site, these are not being used. Moreover, some advertising posted on one of them has been allowed to remain there for many months. The entire website is in English with not even top-level pages being available in French or other world languages.

Occasional glitches in communications occur which seem to result from the use of incomplete or outdated lists of email addresses. We suspect that this arises from individual staff in the secretariat managing their own address lists rather than this being a centralised activity.

Few individuals that we interviewed were receiving, reading or even aware of the INDEPTH newsletters or circulars from the Executive Director. These communications do not seem to be effective as a way of updating the staff of member sites or external stakeholders about INDEPTH's achievements, of informing individuals about specific research and training activities that might be of interest to them, or of encouraging people to visit the website for more detailed information. While not ourselves competent to attempt a diagnosis of the problem, at least in part it reflects a failure to get enough of their potential audience to subscribe to these communications in the first place.

Recommendations

Communications and external relations have previously been identified as a weak area of the secretariat and remain so to date. Unfortunately, the person brought in to run this section failed to meet the expectations of the Network and left their post last year. Filling the position should be considered an urgent issue.

The secretariat also needs to establish the role of Deputy Director either by internal promotion or external recruitment. One possibility might be to divide up deputizing for the Executive Director in his external-facing and internal-facing roles between two existing members of staff. Another option, if a suitable candidate can be found, might be to upgrade the vacant post of Communications Manager to that of Deputy Director (with particular responsibility

for internal and external communications) as the Communications Manager would ideally have substantial experience of working in a relevant research environment.

Communications within the Network need to be regular and to reach as many appropriate individuals as possible. Procedures should be established to enable the secretariat to maintain a central up-to-date database of the email addresses of particular groups of individuals (SAC members, nominated site leaders, information-technology staff, newsletter subscribers, those attending the 2010 Annual General Meeting, etc.). Use of these lists should be compulsory for all staff sending out circular emails to avoid use of inaccurate and out-of-date addresses.

Once a Communications Manager has been appointed, both the design and the management of the website should be reviewed to ensure that it caters adequately for different groups of users, and to improve management of the updating and integrity of its content. Even if subsidiary websites such as those established by MCTA, INESS and iShare are maintained independently, they should adopt a coherent look representing the INDEPTH brand. The website might benefit from the adoption of a more sophisticated content management system than that used currently.

The new Communications Manager should also review the use of e-newsletters to communicate with site staff and other interested individuals. While we lack expertise in this area, a single well-produced e-newsletter could probably serve the needs of different groups of readers so long as the items in it were kept brief with links to the website for more detailed information. The newsletter might report details of INDEPTH initiatives, activities, new resources on the website, Working Group outputs, publications, and so on. It might include a feature on a site or project of the month. The newsletter should advertise opportunities to participate in Network activities but make it clear that applications must be submitted via, and approved by, site leaders.

It would be useful if, when the secretariat recruits staff internationally, they were able to speak either French or Portuguese. This should not take priority over other requirements for the post. While English should remain the sole working language of the Network, it should be considered when redeveloping the communications strategy whether key documents intended for either internal or external consumption should be translated into other languages. It should also be considered whether at least the home and second level pages of the INDEPTH website should be available in multiple languages.

3.5 The Scientific Advisory Committee

The Scientific Advisory Committee (SAC) assists in maintaining the focus of INDEPTH on health, population and social issues and areas of greatest potential impact; encourages linkages between INDEPTH and relevant donors, research bodies and networks; and helps maintain the scientific standard of INDEPTH research studies. Members of the SAC serve on an honorary basis and are selected on their individual merits and personal commitment to INDEPTH's objectives. They are drawn from diverse constituencies including academic institutions, agencies and NGOs, and pharmaceutical and clinical research organisations.

Issues to consider

The responsibilities and operating procedures of the SAC are less transparent than those of the other bodies that constitute INDEPTH. For example, while terms of reference do exist for the SAC, it is uncertain to what extent the activities of the SAC have been shaped by them. Moreover, the formal requirement that SAC members serve for one or two three-year terms has not always been followed. With regard to its remit, it is unclear whether the SAC is responsible for matters relating to the ethics of HDSS or if it has a formal role in the review of research proposals submitted by or to the Network's secretariat. It is also unclear what the procedures are for nominating SAC members and whether its chairperson should be appointed by the Board from among its existing members.

Perhaps as a result, many of the site staff that we interviewed were only vaguely aware of the constitution and activities of the SAC. In part, this reflects the fact that SAC focuses on the Network as a whole and its Working Groups, rather working with individual sites. Nevertheless, greater clarity about the functions of the SAC would help to prevent member sites developing unrealistic expectations of what advice they can expect from this source.

The membership of the SAC needs to be managed carefully to ensure adequate representation of disciplinary and other stakeholders. Strong demographic input is important as few site leaders (and therefore few Board members) have a formal training in demography. It would be appropriate if more French and Portuguese speaking scientists could be involved. It might also be useful if the SAC included members with links to scientific organisations and networks with missions that relate to that of INDEPTH (e.g. the International Union for the Scientific Study of Population) or to major users of INDEPTH research (e.g. World Health Organization or the Health Metrics Network). However, all SAC members need to have established reputations as research scientists and relevant experience. Therefore, INDEPTH

should continue to invite suitable individuals to join SAC (possibly after discussions with stakeholders), and not allow other organisations to nominate a person of their choice.

The current arrangements by which the SAC report back to the Board and advise the Executive Director seem inadequate. In particular, the existing arrangement whereby the SAC meets with the secretariat's Scientific Coordinator immediately before the Annual General Meeting in parallel with a meeting of the Board makes it impossible either for the Chairperson of the SAC to attend the Board meeting or the Executive Director to attend meetings of the SAC.

It is important to remember that SAC members do not work at INDEPTH sites and represent volunteer labour. Thus, the Network needs to ensure that it does not make unrealistic demands on the time of the SAC and that its terms of reference ensure that its members focus on the most important of the many services they could potentially perform for INDEPTH.

Recommendations

The constitution, composition, and role of the SAC should be revised and further developed.

Meetings of the SAC should be held at a different time from meetings of the full Board, perhaps when the Board's sub-committees are meeting so that the Chair of the SAC can regularly attend Board meetings. Procedures for both face-to-face and written communication between the SAC and the secretariat and Board should be reviewed.

3.6 Financial issues

As mentioned already, INDEPTH's budget has risen rapidly in recent years due largely to two large awards from the Gates Foundation. While the Network's main funders in its early years were Sida and the Rockefeller Foundation, it now holds substantial awards from five funders, together with smaller amounts from other organisations (see Annex 3.2).

Sustainability of the secretariat is tied to having a steady cash flow with which to pay staff salaries, rent offices, and meet other recurrent expenses. However, apart from modest expenditure on self-maintenance and self-governance (e.g. organising and paying for meetings of the Board), the secretariat's efforts are almost entirely devoted to the coordination and administration of research, training and dissemination activities that directly further the Network's objectives. Thus, the secretariat's role is primarily to administer the project funds awarded to INDEPTH by what is literally a handful of large organisations (see Annex 3.2 for

details). These administrative costs are inevitably somewhat greater than when an award is made to a unitary organisation. In particular, in the case of many its awards, responsibility is delegated to INDEPTH's secretariat to allocate the funds to the most appropriate activities, sites, and individual researchers and trainees. In this context, the distinctions between direct and indirect costs or marginal and overhead costs that can be applied to larger organisations with more diverse missions make little sense. Between them, the Network's funders need to assume responsibility for funding the secretariat that administers their grants.

In the context of limited and competitive funding for research and research networks, it is important that the secretariat maintain some buffer funding to cushion against periods of low inflow. Currently the secretariat has a buffer of funds that can sustain its core activities for about one year in the absence of further funding. This is commendable; however, fiscal discipline needs to be maintained to ensure that this buffer is maintained and is not eaten into unless absolutely necessary.

4. Scientific activities

4.1 Data quality and standards

The timely production of high-quality data is the foundation of any HDSS system and the pre-condition for its scientific use. All HDSS aim to keep track of the entire population of the surveillance area and to identify all births, deaths and moves occurring in it. Most of them also aim to identify causes of death by means of verbal autopsies.

Beyond these basic functions, HDSS vary greatly in their sophistication. For example, HDSS differ in the extent to which they can identify as the same individuals those people that move between households within the HDSS or emigrate from the surveillance area and later return. Equally, they vary in whether they link spouses to each other or children to both their parents. They also vary enormously in the amount of health and socio-economic data that they collect on the population under surveillance.

Issues to consider

For the HDSS data to be of scientific value, they must attain minimal levels of completeness and reliability. For example, a systematic failure to detect migratory episodes can badly bias denominator data on person-years of exposure and failure to record demographic events, particularly deaths in early infancy, leads to underestimation of vital rates. Only if HDSS can demonstrate that the data they are producing are of acceptable quality for the purposes of monitoring demographic and epidemiological trends and aetiological research will they be able to maintain the case for funding in the longer term. At present, few HDSS have either published detailed evaluations of their fieldwork and data processing activities or made sufficient data available to outsiders to allow them to assess the extent and scale of any limitations of the data.

In order to conduct cross-site comparative research, HDSS data need to be not just of high quality, but comparable. Consistency of definitions and comparability can in some cases be achieved at the analytic stage, without the adoption of common questionnaires and uniform field procedures being necessary. This may be the case for measuring age patterns of fertility and mortality.

Even an informal review of the literature on HDSS rapidly makes it abundantly clear that it is the information that HDSS can provide on cause-specific mortality by means of verbal

autopsies that excites most interest on part of the scientific community and other stakeholders, such as national governments and the various United Nations agencies, including the World Health Organization. Unfortunately, many sites struggle to produce timely statistics on causes of death, mainly owing to the difficulties they encounter in finding physicians to undertake coding of causes of death. Moreover, a scientific consensus seems to be emerging that it is only by use of standardized verbal autopsy instruments and algorithms for identifying causes of death that such data can be rendered comparable across sites. Indeed, when statistics on causes of death are obtained using idiosyncratic instruments and procedures and physician coding of causes of death, it can become difficult to interpret their significance even in site-specific research.

Recommendations

As a medium-term goal, INDEPTH should aim to adopt a quality assurance role with regard to the reliability and validity of the HDSS data generated by member sites. The requirement that sites produce a minimum dataset each year as a condition for continued full membership of the Network should be regarded as a first step in this direction. Eventually, membership of INDEPTH should represent a guarantee to the wider scientific world and to national and international agencies of the completeness and reliability of the information produced by a site's HDSS.

The steps taken to assure the quality of member sites' data should be enabling rather than punitive. The approach should be to help sites to identify any limitations of their data collection systems, data processing operations or analytic procedures and then to correct them. Initial steps have already been taken in this direction by the Working Groups evaluating the quality of the age-specific fertility and mortality estimates produced by sites.

One area in which INDEPTH should strongly encourage member sites to adopt standardised questionnaires and procedures is verbal autopsy methods and the determination of causes of death. INDEPTH participated in the process that led to the production of new verbal autopsy tools by the Health Metrics Network. Following the logic of its own actions, we propose that the Network makes a clear recommendation to all member sites that they upgrade to the new questionnaires. Indeed, it is unclear why the 2003 INDEPTH verbal autopsy questionnaires remain available on the tools section of the Network's website. Of course, any change in its survey instruments will reduce the longitudinal comparability of a site's data series, but the new Health Metrics Network verbal autopsy questionnaires are in many ways an evolutionary

development on INDEPTH's own questionnaires. Moreover, those sites that are using other instruments need to consider whether there is any case for maintaining a lengthening series of what may be poorer quality data that makes it impossible to situate health conditions in their site in a global context.

In parallel with standardization of questionnaires, we recommend that INDEPTH also request all sites to code causes of death using standardized procedures. We propose that these should be based on the InterVA tool, which is being increasingly accepted as having established its merits. No reason exists why sites should not also produce parallel statistics using physician-coded verbal autopsies if these are needed to support their own research projects. However, the InterVA approach or something similar represents the only viable strategy to produce timely and comparable cause-of-death statistics for an expanded minimal dataset.

4.2 Data sharing and preservation

INDEPTH has achieved much in terms of documenting procedures and improving standards for collection, editing, and storage of HDSS data. Data documentation, archiving, retrieval, and sharing remain more problematic. One problem may have been that the information-technology systems of many sites were developed by personnel more interested in database design and management and in the interface to data collection via data capture and editing, than in the needs of analysts.

INDEPTH has recognised that data sharing either between member sites or with outside analysts for the purposes of conducting cross-site analyses requires investment in data documentation and pre-processing to get them into a format that scientists without an information-technology background are capable of analysing. Comparative studies require comparable data. This recognition underlies initiatives such as iShare and the proposal for an INDEPTH Data System.

Issues to consider

Data sharing outside the Network is an issue of growing importance to a number of the Network's funders. The issues involved in widening access to data have been widely discussed in recent years and do not need to be aired at length here.[2] What it is worth emphasising is that, as well as requiring investments in making the data from different sites

[2] Chandramohan, D., Shibuya, K., Setel, P., Cairncross, S., Lopez, A.D., *et al.* (2008). Should data from demographic surveillance systems be made more widely available to researchers? *PLoS Medicine* 5(2): e57. DOI: 10.1371/journal.pmed.0050057.

comparable, the imperative to share data is logically, morally and practically welded to the imperative to invest in capacity development. HDSS data must ultimately be shared with the wider scientific community for the maximum public good, including that of the informants supplying them. Equally, scientists working in field sites are entitled to benefit professionally from the research data that they generate. Ultimately, it will be impossible to recruit senior staff to work on HDSS unless they are enabled to benefit in this way. Moreover, without additional capacity development, many sites will struggle to make available high-quality, well-documented data to outside analysts.

It is notable that the INDEPTH sites with a strongest commitment to data sharing are among the better resourced and more productive in the Network. As their analytic capacity and scientific productivity rise, further sites will become better able to conduct both straightforward and more challenging analyses of their own data in a timely way without worrying that other researchers might beat them to publication. Thus, augmented capacity will lead to data sharing being viewed increasingly not as a threat, but as a way of leveraging the value of sites' data and of strengthening the case for continuing funding of the HDSS. Nevertheless, the timescale for data sharing that is fair on field sites in resource-poor countries where a major part of the time of the scientific staff is taken up by data collection will always remain longer than that appropriate for well-funded research groups embedded in research universities in the North.

Recommendations

The policy, intellectual property, technical, ethical and other issues relating to data archiving, extraction and sharing are becoming so central to the future of INDEPTH and its member sites that a case exists for establishing a data administration committee, as distinct from the SAC and relevant Working Groups, to draft and promote the Network's policies and technical strategies about these matters and provide advice to member sites. This committee should include at least one Board and one SAC member and the Network's Information Systems Manager, as well as other scientists and information technology specialists interested in these matters. It should probably also include representatives of key external stakeholders such as the Health Metrics Network. Crucially though, its remit must be to advise on how to provide the functionality required by analysts (whether from inside or outside the Network) and it should not be dominated by database specialists who are not involved in data analysis.

Whether through such a data administration committee or by other mechanisms, INDEPTH needs to develop a policy on data sharing even if this is not (initially) binding on all member sites. While protecting the interests of both the populations under surveillance and institutions generating the data, this policy should be supportive of the movement toward providing wider access to HDSS and other scientific data. Equally, the Network should clearly and consistently link the issue of data sharing with the need to continue to strengthen the capacity of Southern institutions running HDSS to analyse these data themselves in order to address the entire spectrum of local, national and global health research priorities.

By no means all INDEPTH member sites have adequate systems in place for the long-term preservation of their HDSS and other data, including discontinued data series and one-off data sets, together with machine-readable metadata. Thus, this is another area in which INDEPTH could facilitate sharing of experience and capacity development. One strategy would be for the Network to restrict itself to providing guidelines and tools that could be used by sites concerned to archive their own datasets. A more efficient approach might be to establish an INDEPTH Data Repository managed by the secretariat (although probably outsourced as a physical facility) in which sites could place documented datasets. This need not imply sites giving up ownership or control of these data. Among other advantages, the latter approach might help to prevent the permanent loss of data if a particular site is forced to close down.

4.3 Scientific productivity

The raison d'etre of INDEPTH is to improve the amount, quality, and impact of the research conducted by member sites. The Network has achieved a lot in the last decade in terms of both improving capacity in sites and its own comparative research. The main vehicle that it adopted initially for publication and dissemination of its cross-site research was a series of research monographs. These comprise monographs on *Population, Health and Survival at INDEPTH Sites*, *INDEPTH Model Life Tables for sub-Saharan Africa* and *Measuring Health Equity in Small Areas* (see Annex 3.3). A monograph on *The Dynamics of Migration, Health and Livelihoods* has just been published and one on *Causes of Death* exists in manuscript. Increasingly, INDEPTH has also been publishing the results of its comparative research as articles in peer-reviewed journals or as collections of articles in journal supplements (see Annex 3.3).

INDEPTH's last Strategic Plan listed nine priority research areas for the period 2005-9. The areas for research were:

1. Create the capability to design and test new effective and affordable interventions and delivery mechanisms by building an Integrated INDEPTH Health Intervention Trials Platform
2. Measure the risk factors and burden of malaria and design, test and help roll out interventions and delivery mechanisms to control the disease
3. Work to better measure the impact and burden of HIV/AIDS and design and test interventions to limit its spread and contain the disease
4. Continue to pursue efforts at measuring the cost of health inequities and health impact of economic inequity
5. Assess the impact of key demographic factors including migration and urbanization on health
6. Increase knowledge of adult health in developing countries
7. Disseminate scientific findings and complete the monograph on "Cause of Death at INDEPTH Sites" and continue the "Population and Health" monograph series
8. Leverage the scientific findings from INDEPTH sites and studies into health policy/practice recommendations and changes
9. Integrate DSS data with census data to better understand the population dynamics in Africa.

Progress on this series of research topics has been mixed. Some planned research has been completed successfully. For example, projects on migration and urbanization (item 5) and non-communicable diseases in Asia (item 6) have been completed and published and a further project on adult health and ageing is nearing completion. Other priorities have been redefined. For example, the Integrated INDEPTH Health Intervention Trials Platform (item 1) has become the successful Malaria Clinical Trials Alliance project. Other projects remain incomplete. For example, while the work on causes of death (item 7) has generated a journal publication, the planned monograph has never appeared. Yet other topics have seen some activity, but without this generating much progress toward a defined output (item 9), while little or no progress at all had been made on a few topics by the end of 2009 (items 3 & 4).

Issues to consider

If it is viewed as a work plan, the set of research priorities defined in the 2005-9 Strategic Plan was very ambitious. It might be more realistic to regard these priorities as aspirations.

Thus, the rather patchy progress towards their achievement by INDEPTH, that has just been reviewed briefly, is not in itself clear evidence of underperformance. Nevertheless, a consensus does exist among scientists and other stakeholders from outside the Network that we interviewed that the scientific productivity of many HDSS and of the Network itself remains rather low by international standards. Of the cross-site research outputs produced by INDEPTH to date, only the work on age-specific mortality patterns and on causes of death have been sufficiently widely cited to be regarded as high impact. Limited scientific productivity is a major threat to the sustainability both of individual HDSS sites and INDEPTH itself.

The root of the problem is the limited number, inexperience and sometimes inadequate training of the scientific and professional staff working at many member sites. Some sites have a very small group of scientific leaders. In other instances, the site is strong in other forms of research but ill-equipped to fully exploit the potential of its HDSS data. Such limitations are compounded in specific instances by either the restricted capabilities, or the complexity, of the databases used to store the HDSS data.

The shortage of analytical skills in some member sites creates unfortunate trade-offs for both the Network as a whole and those leading Working Groups between being inclusive and being effective and between producing outputs in a reasonable time-scale at a reasonable cost and producing high-quality science. However, such conflicts represent not so much a failing of INDEPTH as one reason why its work is crucially important to everyone with a stake in HDSS and the research they conduct.

One crucial capacity issue seems to be the extraction of data from the HDSS databases and construction of rectangular data files including derived variables suitable for statistical analysis. Even more specifically, the experience of particular Working Groups suggest that many sites lack skills in demographic analysis, the calculation of person-years based denominators for the calculations of rates, and in regression-based methods for longitudinal data analysis.

Recommendations

To continue to develop the research productivity of member sites, INDEPTH should persist with its dual strategy of improving capacity in sites through the activities of Working Groups and through a programme of training activities. In addition, while continuing to ensure that

overall leadership of its scientific activities remains within the Network, INDEPTH should seek to develop stronger research collaborations with outside scientists from both local universities in the South and partners in international organisations and Northern-based institutions.

INDEPTH must campaign and work for fuller exploitation of sites' data, but should not impose specific research topics on sites. As a supplementary strategy to the comparative studies pursued by Working Groups, it might consider commissioning a series of "Illustrative Analyses". This would entail an analyst working with one site's data producing a research paper on a strategically important topic that demonstrates to other sites what they can potentially achieve with such data. Backup documentation of how to produce the results would be helpful. Ideas for such analyses might be developed by Working Groups, by the SAC, or proposed to the secretariat by individual researchers. Though not intended as such, the Network's recent volume on *Environmental Factors and Malaria Transmission Risk* could in some respects be regarded as such an illustrative analysis.

4.4 Scientific vision and strategy

INDEPTH has a clearly defined mission and objectives and has developed a series of strategic plans for the Network. However, it has never articulated a clear statement of its scientific vision and strategy. The Network's stated research objective is to support sites to conduct longitudinal health and demographic studies. Its list of areas in which it should be active also mentions coordinating multi-site evaluations of interventions and addressing "the emerging agenda of non-communicable disease and ageing, violence and injury, migration and urbanization, and the problems associated with vulnerable population segments". INDEPTH's 2005-9 Strategic Plan did identify nine priority areas for research (see section 4.3) and declares that these were selected on the basis of "the needs of the studied populations as well as the major concerns of public health authorities, NGOs and major donor organisations". It argues that focusing on these areas "will enable INDEPTH to grow into a major Southern-based institution, with the capabilities to design and test new interventions, monitor the ongoing burden of high-prevalence diseases, and assess the impact of socio-economic demographic factors, including economic inequity, migration and urbanization".

Issues to consider

It is unclear how a concern to address the needs of the studied populations and major concerns of public health authorities, NGOs and major donor organisations leads to a focus on the

particular research topics prioritized in the 2005-9 Strategic Plan as opposed to alternative topics such as, for example, the health and welfare of children or reproductive health. Equally, it is obvious that not all important health issues of concern to those working to improve global public health are amenable to investigation by means of HDSS data. INDEPTH's stated mission is to harness the collective potential of community-based longitudinal surveillance. However, the Network has not succinctly explained and justified, either to itself or the outside world, the rationale that determines what topics it believes it should be investigating using multi-site, longitudinal, population-based health and demographic surveillance data.

Our interviews make it clear that most Board members, site leaders, senior staff of the secretariat and other senior scientists involved in INDEPTH have clear and strong views about what sort of research the Network should engage in, although inevitably they differ somewhat in their views. What INDEPTH has never done is to articulate a clear statement of the comparative strengths of HDSS data and to propose a scientific strategy based on these. A clear scientific vision of this type would help INDEPTH to negotiate with funders, including bilateral donors, by clarifying how the Network fits into the wider international effort to improve health and achieve the Millennium Development Goals and how the money being requested from a particular funder would contribute to that vision.

One characteristic that unites almost all the sites that are members of INDEPTH is that their research agenda are focused on health issues and that they are staffed almost entirely by epidemiologists, specialists in the infectious and parasitic diseases, and – to a lesser extent – demographers, health systems researchers, and medical anthropologists. Longitudinal demographic surveillance, however, provides a strong basis on which to mount research studies that relate to the full set of Millennium Development Goals, including population-based investigations of poverty dynamics, children's education, gender roles, environmental change and of how these issues relate to each other and to health. Most sites currently lack expertise in most of these fields. For example, few of them employ any professional staff with a background in economics or social policy research. However, expertise in all these areas is to be found somewhere within the Network. Thus, multi-site collaborations organised by INDEPTH are potentially very valuable to sites that want to further leverage the value of their HDSS data by doing more to address this wider research agenda. Recognising this, INDEPTH has considered establishing Working Groups in several of these areas, although its only

completed output is a tool for measuring socioeconomic status developed for the health equity project (www.indepth-network.org/core_documents/02.indepth_he_ses_tool.zip).

Recommendations

Having established itself as a functioning research network with a substantial portfolio of activities, INDEPTH needs to focus now not so much on further expansion as on pursuing key activities that address medium-term objectives and to ensure it does not dissipate the energies of the secretariat and others pursuing funding in an opportunistic way. Perhaps INDEPTH should do a bit less, but do it better.

The Network needs to articulate an overall vision of its scientific aims and its research priorities. This should not be simply a list of themes or topics. Rather it should define the types of research where INDEPTH has a comparative advantage. In essence, such an advantage exists whenever the research question needs to be investigated using multi-site, population-based longitudinal and/or verbal autopsy data. This consideration, in combination with those of the public health importance of the research question, its "fundability", and the degree of interest of member sites provides a coherent rationale for developing a more specific research strategy. This strategy should identify both the "next steps" to be taken on themes of enduring importance and new areas that it is timely to develop. It should cover both the emerging research agenda and steps to deal with key capacity issues (e.g. software to generate comparable datasets, elimination of backlogs on verbal autopsy coding, etc). Moreover, setting out a clearer explanation of what research INDEPTH should be doing and why, would also help to clarify what research questions it should *not* prioritize.

The types of research question for which HDSS data are particularly powerful include:

1. Comparative demographic analyses, particularly those on topics about which Demographic and Health Survey and similar single-round retrospective surveys provide limited data, for example adult mortality.
2. Monitoring of cause-specific mortality trends, together with all other research that uses mortality from a specific cause or group of causes as its outcome variable.
3. Research that requires longitudinal data to sort out the causal ordering of events.
4. Research into interrelationships between various demographic statuses and events such as migration, child-bearing, health, residential arrangements, and mortality.

5. Cross-site observational research on the unintended positive and harmful impacts of existing health interventions that it would be unethical to investigate by means of experimental trials.
6. Interventions research that cannot be conducted on facility-based cohorts as it requires measurement of population-based outcomes.

Once the strengths of population-based, longitudinal surveillance data, and of the statistics on causes of death that HDSS can generate in countries without routine death registration and medical certification of causes of death, have been spelt out clearly, this statement will become a resource that can provide an key part of the rationale for seeking funding for specific Network projects.

As a medium-term goal, INDEPTH should encourage member sites to further leverage the value of their longitudinal, population-based data by developing a broader economic and social research agenda addressing the full spectrum of development issues that are targeted by the Millennium Development Goals. Thus, the Network's recent initiatives to encourage research relating to education, environmental change, and so on should be maintained or revived. In addition, increased attention should be given to the measurement and investigation of longitudinal poverty dynamics, livelihoods, and their interrelationships with health and the other welfare issues already focused on in sites' research programmes.

Of course, not all research conducted by INDEPTH sites does require population-based longitudinal data. For many projects the HDSS provides a useful platform on which to establish the study but is irrelevant to measuring its outcomes. Arguably, such studies are not as strong candidates for cross-site research initiatives as those that do involve analysis of the HDSS data. Moreover, in some instances trials benefit from the existence of a HDSS platform without contributing anything to its core costs. All funders of such studies should contribute to the support of the HDSS. INDEPTH should pool sites' experiences of different mechanisms and funding models adopted to achieve this, It should also consider whether a consistently applied INDEPTH policy on this issue would be a useful bargaining chip that could be used by site leaders in negotiations with funders and that might reduce any concern on their part that insisting on such contributions might result in the study being relocated to another site.

4.5 Organisation and functioning of Working Groups

Working Groups are the primary vehicle through which INDEPTH conducts its scientific activities. Each focuses on a specific research topic or project that has been identified as of priority interest and on which a number of sites wish to work collaboratively. Working Group members are drawn from member sites, the secretariat and SAC. Each has a leader or principal investigator appointed by the Board, usually on the recommendation of the Executive Director.

The agenda of Working Groups are very varied (see Annexes 3.4 and 3.5). For example, some have focused on the production of key demographic indicators for as many sites as possible; some are collaborations of a handful of sites involved in the collection of supplementary data to answer a particular question, while others have focused on the development of software.

Issues to consider

The record of INDEPTH's Working Groups is mixed. Some have achieved very little and Working Group leaders emphasize that it is a challenging and sometimes frustrating process to bring a cross-site study to a successful outcome. All those we spoke to emphasized that the activities of their Working Group had required attention to developing the skills of at least some of the sites involved.

We heard complaints from multiple sites about their interactions with Working Groups in which they are not participating at the steering group level. Some comparative projects require data from as many sites as possible. Sites expressed dissatisfaction with receiving requests for statistical information, drafts or revisions to manuscripts with what they see as unreasonably short deadlines. Sites sometimes failed to understand the aim and value of the tables they were being asked to produce and quite often had difficulty in producing the statistics requested. Equally, the problem sometimes occurs of sites opting to participate in Working Groups and then failing to produce monograph chapters to agreed timetables.

Recommendations

As suggested in the preceding sub-sections of this report, INDEPTH's current priority should be to improve the quality, not the quantity, of its research. Thus, we recommend that INDEPTH should be cautious about further extending its number of Working Groups. Indeed, it might benefit from focusing down somewhat. It would be wrong to try and restrain sites from working collaboratively in any way that they wish to. Equally, it makes sense to focus the energies of the secretariat on activities that are strategically important for the Network.

Thus, the Network could divide its collaborative research projects into two categories – those which get full administrative support from the secretariat and those which are conducted by groups of sites with the secretariat having a light-touch liaison role to ensure that wheels are not reinvented and INDEPTH gets due acknowledgement.

The secretariat need to work with Working Groups to help them to develop realistic work plans with milestones against which their progress can be monitored. Tighter project management should help to reduce the problems that ensue when Working Groups fail to complete activities that involve spending money in the financial years for which they have been budgeted. Moreover, if site leaders had better idea in advance of the timelines of the portfolio of Network activities in which they are participating, it would be easier for them to link their contributions to INDEPTH into their other streams of activity.

Communication between Working Groups and the sites contributing data, tables or manuscripts to their activities has not always worked well. This is potentially a problem with any activity that involves more sites than can be represented on the steering group. This suggests that the secretariat needs to ensure that requests by Working Groups for inputs from sites are both preceded and accompanied by a better written briefing explaining the overall scope and timetable of the project, the rationale underlying such requests and, if necessary, providing more guidance on the calculations involved and explaining who can be contacted for technical assistance.

A major factor limiting the productivity of Working Groups is that most people participating in their activities have multiple competing demands on their time and find it difficult to give priority to the Working Group project when based at their home site. They may need to be taken out of their usual environment at least twice for long enough to ensure that data analysis, at the initial workshop, and then writing up, at the second one, get well under way. At times, “virtual workshops” may fulfil the same function, with the pre-condition for the success of this being that everyone involved – and their managers – knows well in advance that a particular period needs to be blocked out to focus on a specific activity.

In general, INDEPTH should integrate scientific activities of Working Groups and capacity development more, rather than seeing them as parallel activity streams. The value of training workshops can be limited unless participants follow up on them by putting their new skills to use when they return to their sites. Equally, more Working Groups than at present may need

to adopt a practical hands-on approach to helping everyone involved to produce the required indices from the raw data. It is sometimes important to partner up and work with both information technology and scientific staff. Also, we suggest conducting more workshops at site offices, rather than in Accra or at the Working Group leaders' home bases, so that site leaders can directly observe what is being achieved.

Tensions over data sharing *within* INDEPTH and between site-specific and comparative research on the same issues could sometimes be defused by regarding these as linked rather than competing activities. Often comparative analyses focus on the limited questions that can be answered with the "lowest common denominator" of data that all sites produce. The scientific staff contributing to the INDEPTH Working Group and benefiting from that interaction could also work in parallel on site-specific research papers that exploit the full potential of each site's data.

In order to improve their productivity, some Working Groups may need to be better resourced in terms of funds for travel and salaries for support staff. While the logistic support received from the secretariat is praised and valued, the senior scientists heading Working Groups are having to do a great deal of legwork themselves on the scientific aspects of the work. One way of alleviating this burden would be to fund part-time administrative support for Working Group leaders in their own institutions rather than doing everything via Accra. Another possibility would be for the Network to hire junior scientists (at the post-doc level) as staffers for Working Groups. Their salary might be paid from central funds initially, with the stipulation that the Working Group must then raise research funds to cover the post-doctoral researcher's salary if the arrangement is to continue.

The success of the Working Groups depends not only on strong leadership and on resources, but in part on their detailed working methods. And least some of the lessons that have been learnt about effective working procedures should be codified in documentation made available to Working Group leaders instead of relying on personal communication to pass institutional learning. Thus, the existing guidelines for Working Groups, which focus on procedures for communication between the Working Group and secretariat, need developing further. All Working Group leaders and members should receive a formal letter of appointment clarifying what is expected of them and enclosing relevant procedural documents.

Monographs are not in general a high impact way of disseminating research findings and are less valued as outputs by most site staff and site leaders than papers in peer-reviewed learned journals. As broadband access becomes more widespread and reliable, the impact and kudos attached to publishing in journals distributed across the internet is only going to increase. Thus, INDEPTH should focus on special issues and supplements as the primary way of disseminating Working Group outputs. This may require building funding into Working Group budgets to subsidize publication.

4.6 Purpose and format of the Annual General Meeting

INDEPTH's Annual General Meeting (AGM) is currently a four-day event, which attracts some 200-250 participants to at least part of the proceedings (see Annex 3.6 for details). They include a group of young scientists sponsored by the Network (see section 5.3.3). The AGM serves diverse aims and constituencies. In administrative terms, it is the occasion of the General Assembly of site leaders as well as providing an opportunity for the Board, the SAC, and various Working Groups and interest groups to meet. In scientific terms, the AGM provides an opportunity for Working Groups to report back to the Network on their activities. It also includes a series of plenary and parallel scientific sessions reporting on research being conducted at INDEPTH sites.

The AGM is an expensive event that absorbs considerable resources. However, much of this expenditure goes on funding the attendance of Board, SAC and Working Group members, who would need to meet anyway. Site leaders fund their own attendance.

Issues to consider

A review of the abstracts of papers presented at the 2009 AGM suggests that about 20 per cent of them focused on methodological issues of relevance to HDSS, largely related to various aspects of field operations. Of the remaining papers, nearly half presented research that, although conducted at INDEPTH sites, either made no use of the HDSS data or used it only as a sampling frame from which to select study participants. Most of these papers were reporting on either trials that collected outcome data independently of the HDSS or on qualitative research studies. Of the other papers, about half were longitudinal in that either they were interested in measuring trends in the outcome or they were concerned to relate a prior exposure to a later outcome. The other papers analysed the HDSS data cross-sectionally. It is striking that very few of the papers were using HDSS data to measure the impact of an intervention. Moreover, apart from research presented by INDEPTH Working Groups, no

multi-site research was presented. In particular, there was no evidence of collaboration at the national level in those countries in which multiple HDSS exist. Rather few of the papers had senior scientists with established international reputations as first authors.

Recommendations

Recurrent scientific meetings feed off their own success and INDEPTH should aim to develop the AGM into a showcase for excellent research being conducted using HDSS data. A sustained effort should be mounted over the next few years to further improve the quality and relevance of the scientific papers presented at the AGM. Ideally, the AGM should become the venue at which scientists from member sites want to unveil their best research. It certainly should not be allowed to become an event viewed primarily as providing an opportunity for young scientists to practice their presentation skills. Of course, scientists can and do produce exciting research at an early stage of their career and can benefit greatly from the opportunity to present their work at an international meeting. Equally though, junior scientists benefit greatly from the experience of listening to senior scientists presenting and debating world-class research.

We would not recommend restricting the papers presented at the AGM solely to those that use HDSS data to measure their outcomes. Nevertheless, a greater proportion of the papers presented should be based on HDSS data and, in particular, on innovative and exciting analyses of HDSS data that use them longitudinally or for interventions research. INDEPTH should continue to make such characteristics explicit criteria for the acceptance of abstracts by the AGM organizers and for awarding funding to attendees. Perhaps more importantly, site leaders should invest in INDEPTH in this way for the future benefit of the Network and their own sites. Where appropriate, they should consider presenting themselves at the AGM. They should also encourage all of their staff who are doing important research using HDSS data to submit abstracts to and present at the AGM.

5. Capacity building

Strengthening the capacity of existing and new HDSS sites to conduct high quality longitudinal health and demographic studies is one of the primary objectives of INDEPTH. This objective springs from the recognition that:

1. Many HDSS sites are weak and struggle to generate reliable demographic data and manage and analyse the data. Besides threatening the sustainability of the sites, this weakness undermines the sites' ability to participate in and in turn benefit from the Network's activities.
2. Even among the strong sites, lack of, or inability to employ, standardized HDSS data collection and management platforms is a significant impediment to sharing of data for cross-site studies.
3. Setting up HDSS sites is a complicated process and research groups or institutions intending to establish new HDSS sites require support and guidance in order to ensure that proper research and organisational structures are set in place as early as possible
4. Long-term sustainability of HDSS sites, and in turn of the Network, depends on the member sites building up a pool of independent researchers capable of generating and answering important research questions within a HDSS framework and hence demonstrating the value of HDSS to their communities, governments, and funding agencies.

The collective potential of the Network can only be realized if the member sites are appropriately organised and managed, able to collect data in a reliable manner, manage the data properly, and analyse the data using both basic methods and techniques developed for the analysis of longitudinal data. The sites should be able to interpret the results of the analysis and generate publications based on these interpretations. Importantly, the need to generate data that are comparable across sites in order to facilitate cross-site studies necessitates the standardization of aspects of their data collection and management platforms across the sites. Together these requirements form a conceptual framework for capacity-building needs within the Network. The table below summarizes previous and current INDEPTH capacity-building activities in the context of this framework (see also Annex 3.7-3.10). However, it is appreciated that many of the activities cut across more than one objective – e.g. skills gained

at a workshop on analyzing data for mortality clustering can just as well be applied to analysis of clustering of other phenomena.

Objective	Processes and Products		Examples of Products
	Strengthening of site Personnel	**Development of HDSS Tools**	
Support establishment of new sites and technical support to all sites	Technical site visit by secretariat and experts from other sites	DSS Starter Kit	Use of Starter Kit and site visits to help establish Inganga/Manyunge sites Site visits to: 2009 – Kintampo, Vadu, 2008 – Matlab,Chakaria, 2003-2008 – Karonga, Kachanaburi, Filabavi
Promote efficient site management and administration	Workshops on site management	INDEPTH Resource Kit	2004 – Leadership and management workshop 2004 /2008 – Finance managers' workshop 2008 – Site administrators meeting
Ensure reliable collection and management of data	Data managers' workshops	INDEPTH Resource Kit INDEPTH Verbal Autopsy tool	2009/2008 – Communications workshop 2009 – Data documentation workshop 2009 – Biometric identification workshop 2008/04 – Data manager technical meeting 2005 – Good Clinical Practice workshop 2004 – Verbal Autopsy coders workshop
Increase sites' capacity to analyse data	Data analysis workshops Specific analysis methods workshops Short courses on statistics and demographic data analysis		2008 – Basic biostatistics workshop 2003 – Multi-level analysis workshop A large number of workshops aimed at building up specific skills required for different workgroup projects e.g. Writing of Fertility Monograph (2009), Clustering of Mortality (2009), Adult Health and Aging (2008) 2009 – Workshop on statistical and demographic data analysis, Ghana 2009 – Workshop on qualitative and quantitative research methods 2009 – Mahidol University course on reproductive health
Increase capacity for data sharing and cross-site studies	Specific analysis methods workshops Financial support for cross-site projects	INDEPTH VA tool Open HRS	A large number of workshops aimed at building up specific skills required for different workgroup projects Small Grants Programme - Six consortia with interest ranging from creating new data systems to gender and chronic diseases have been awarded grants since 2007

	Funding for specific cross-site projects		INESS and MCTA infrastructural and personnel support to participating sites
Strengthen capacity of sites to publish their research	Writing workshops		2004, 2007, 2009 – Scientific writing workshops
Build a pool of independent researcher at sites	University of Witswatersrand Masters programme (Leadership programme) INDEPTH Fellows Young Scientists' travel grants to AGM and workshops Post-training funding for Masters students		2005-2009 – 27 students have been trained; practically all have gone back to their home sites 2009 - Eleven fellows in seven HDSS sites 2009 – over 30 young scientists sponsored 2004-2008 – some 10-20 sponsored annually INDEPTH re-entry grants initiated in 2009

The table above clearly indicates that INDEPTH has been very active in its attempts to strengthen capacity within the Network. At an operational level, feedback from participants and their respective sites indicated that the secretariat is efficient in organizing the workshops or supporting the hosting sites. Generally, the participants commended the secretariat for its support on travel and other logistic arrangements.

Ultimately the goal of all these activities is to enhance individuals' and sites' capacity to carry out demographic studies effectively. Clearly there are many factors beyond those addressed by a workshop that might affect realization of this goal. As such, it is not usually possible to singularly attribute success or failure in the attaining of a particular capacity by a site to a given activity. Nonetheless, through in-depth interviews of participants and other personnel (particularly site leaders and managers) at the sites, it was possible to get a sense of both the impact that these activities have had within sites and issues around the activities that may require attention.

5.1 The establishment and efficient management of sites

HDSS are highly valued as platforms for demographic research and population-based intervention studies. However, establishing and managing an HDSS site is a challenging

process requiring action on a large number of fronts ranging from setting up physical, administrative and research infrastructures; to setting up information technology systems; to training field staff. INDEPTH has tried to harness the collective experience of the Network to help emerging sites (and existing ones) meet these challenges in three ways:

1. Through the development of resource kits; initially an HDSS starter kit and subsequently a more comprehensive INDEPTH Resource Kit for Demographic Surveillance Systems.
2. Through technical visits to the sites by members of the secretariat and experienced staff from the more established sites.
3. By supporting workshops for site administrators and financial managers.

Many sites acknowledge the importance of both structured and continuing support from the Network both through the technical visits and their use of the resource kit. The extensive use made of both the starter kit and the technical visits during the establishment of the Inganga/ Mayunge HDSS site in Uganda and to some extent in the establishment of Dodowa HDSS site in Ghana is evidence of the value of these resources. Currently, the INDEPTH Resource Kit and Network's expertise are being used to guide the establishment of a new site in Nigeria and second one in Madagascar.

Even for established sites, deficiency in administrative capacity can affect their ability to expand or participate in large studies that have heavy administrative and managerial demands. Yet administrative capacity is often overlooked in many capacity-strengthening initiatives. Thus, it is commendable that INDEPTH has conducted workshops for site administrators and financial managers. Although sites may vary in their financial and administrative systems, our interviews suggest that the sharing of experiences during the workshops and thereafter is valuable in improving the running of sites.

Issues to consider

1. Currently it is difficult to access the Kit through the website. Whatever the reason, for this technical hitch, it needs to be addressed if sites are to take advantage of the online availability of the Kit.
2. There is a need to keep the Kit relevant in the face of rapidly changing technology. Sites are now moving to new tools such as PDAs and netbooks for data collection.

New management and analysis software are emerging. Thus, the Kit needs to be updated regularly.

Recommendations

The secretariat needs to ensure that the online access for its kits is working properly. In order to facilitate rapid updating, a more dynamic design should be considered. For example, this could take a moderated wiki type approach, where new experiences and techniques can be posted directly into the Kit by specific people from sites and adopted after approval by the site moderator or a small "Kit Committee". This will facilitate rapid incorporation of experiences in the use of new data collection and management technologies into the kits.

5.2 Ensuring reliable collection, management and analysis of data

Generation and management of data in a reliable manner underpin the very concept of HDSS. Yet, generating even the minimum demographic dataset remains a major challenge for many HDSS sites. By undermining the ability of sites to contribute to or benefit from INDEPTH, the differential capacity of sites constitutes a major threat to the cohesive existence of the Network. INDEPTH clearly recognises this and has had a major focus on building up the data collection and management capacities of sites. This is reflected in the large number of workshops for data managers conducted over the years. In addition to building the capacity of sites to generate the minimum demographic data sets, many workshops have been aimed at building the capacity of sites to participate in specific cross-site activities. The consensus among both those who have participated in these workshops and site leaders is that in most cases the workshops have delivered the intended skills and capacity and led to a significant improvement in the day-to-day practices at the site or even the acquisition of new capacities that were lacking at the site prior to the workshop. Furthermore, many participants value the interactions with other participants that develop during workshops. In many instances, they extend and prove useful beyond the end of the workshops.

Issues to consider

1. The time between the calls for the workshops and the deadline for applications is sometime very short. This makes it difficult for sites to send the most suited person as at times such staff may be in the middle of activities from which it is difficult to take leave at a short notice.
2. Probably as a consequence of the timing issue above and perhaps of limited personnel resources in some sites, the mix of people attending some of the workshops is

sometimes very varied in terms of skills and interests. This presents a challenge in delivering the training at an appropriate level.

3. Ironically weaker sites, which need the workshops most, are the ones that often lack the appropriate personnel to send to the workshops and end up either not sending anyone or repeatedly sending the same people to the different workshops.
4. The workshops appear to be conducted opportunistic rather systematically. *Ad hoc* planning of workshops mean that, in many instances, follow-up workshops that would help to cement the skills gained in initial workshop are lacking.
5. From the table, it is evident that much emphasis is laid on data management and analysis workshops.
6. There is a perceived lack of clarity in the process of selecting participants.

Recommendations

The secretariat needs to develop a comprehensive timetable of the workshops that they expect to take place during the year for both general site strengthening and specific Network activities. This will help site leaders to decide well in advance which of their staff is the most appropriate person to attend each workshop and to plan for the periods when those members of staff will be away attending the workshops.

As indicated above, the majority of workshops are slanted towards building data management and analysis capacity. While these are key skills for all the sites, care should be taken not to neglect other capacity needs. An audit of capacity in each the member sites should be conducted periodically in order to identify gaps and hence facilitate the development of a comprehensive capacity-strengthening programme. The audit would also help to peg the level of teaching at the workshops to that of the participants. For example, it may be that personnel from some sites only require an advanced-level workshop in an given area while personnel from other sites may need to start with a basic level workshop before participating in the advanced one if they are to reap real benefits from the latter workshop. Targeting the workshops to the needs of sites will help avoid a potentially vicious cycle of weak sites not having the appropriate personnel to attend the workshops and therefore missing out on the benefit of the workshops and remaining weak.

Given the brevity and intensity of the workshops, it is sometimes impossible to either include or deliver optimally all aspects of the targeted skills in single workshop. This calls for follow-

up workshops to be considered in order to cement and build upon skills acquired at previous workshops.

Finally, the criteria and the process of selection of participants need to be clearly communicated. Not only does selection need to be fair, it also needs to be seen to be fair. For instance, the reasons why an application to participate failed to go through need to be clearly communicated back to the applicants.

5.3 Building a pool of independent researchers at sites

5.3.1 INDEPTH leadership programme

This programme, which is built around an eighteen-month Masters course in Population-Based Field Epidemiology at the University of the Witwatersrand in Johannesburg, South Africa, is the flagship of INDEPTH's initiatives to develop local research leadership at HDSS sites. The course focuses on five areas: epidemiology; biostatistics and data management; demography and other social sciences; information technologies for demographic and health surveillance; and leadership. The course begins with one year of taught modules at the end of which the students travel to one of three learning sites (Navrongo in Ghana; Africa Centre in South Africa; and Ifakara in Tanzania) to spend six months getting practical training on the conduct of research and data analysis in a field setting.

Since the inception of the course in 2005 over thirty students have been trained (see Annex 3.9 for details). Importantly, all the students, except one, have returned to their home institution at the end of the course. Feedback from past students indicates that, overall, they found the course well organized and facilitation and contents of a high standard. The students referred to the broad spectrum of specialties taught as being particularly useful in broadening their thinking around, and understanding of, epidemiologic and demographic concepts. The six-month practical training was considered important and helpful in giving practical experience of the principles taught in class. The leaders of sites that have sent staff members on the Masters programme also consider this a valuable course for building up the research capacity of their sites and are currently satisfied with the enhanced skills that the graduates show evidence of upon returning to the home sites.

Issues to consider

1. The course is an intensive one that some of the students find challenging. However, so far none of the students have failed to complete the taught element of the course, suggesting that while they may feel stretched, they are not being over-stretched.
2. Some interviewees suggested that the balance between the three themes – epidemiology, demography and statistics – may need to be reviewed so that more time is committed to the demography modules, which at present comprise only 13 per cent of the taught component of the course.
3. The need to be proficient in English leaves students from sites in francophone and lusophone Africa and some of the Asian sites disadvantaged compared with those from Anglophone countries. Similarly, the requirement of an honours first-level degree may make it difficult for students from country where there is no immediately equivalent first degree that would qualify them for admission.
4. Many students feel that more support is needed to help them publish the work that they did during their fieldwork.
5. The limited number of HDSS sites that are set up to take in the students for the fieldwork component is a challenge for the course organizers. If funding for more students becomes available, supervisory capacity at the current training sites could become very stretched.
6. Lack of absorptive capacity at the home sites. If the overall aim is to build up leaders in demography within sites and the Network, then retention of the graduates at their home site is very important. Retaining a well trained Masters graduate in a rural setting with low pay is a serious challenge for many sites.
7. Perceived lack of clarity in the selection process.

Recommendations

To help address the problem of retention, the Masters programme needs to be placed within a career framework. While not all the Masters graduates either will or should proceed to do a PhD, ideally those who show research leadership qualities during the Masters programme should be placed on a longer-term training plan that locks directly into a PhD training. Although this is an expensive proposition, the last few years has seen increased willingness by funders to consider more comprehensive approaches to capacity building and this may

make the sourcing of funding for an extended programme less daunting than it would have been previously.

While INDEPTH has started to address the issue of language difference within the Network, it is unlikely that intensive courses will be sufficient to raise the proficiency of the participants to the level required for the entry to the Masters course. While teaching English to site staff on a large scale is beyond the remit of INDEPTH, the current language workshops could be targeted at potential University of the Witswatersrand Masters students.

The need to immediately take up their previous (and new) duties when they return to home sites and lack of support can make it difficult for students to publish the work they carried out during their residency at training sites. It is expected that the newly announced INDEPTH re-entry grants will go some way is helping solve this problem. Although this is a good start, the amount allocated is small. The secretariat might consider raising the ceiling but determine the actual amount to award to each applicant on a case-by-case basis. The secretariat might also consider bringing the students together with a group of senior researchers at some point in order to provide formal support for the writing activities.

5.3.2 INDEPTH fellows

The INDEPTH fellows programme was initially funded by the Hewlett Foundation with the goal of building up analytic capacity in HDSS sites while providing field training opportunities for Masters graduates from population studies programmes in African universities. The programme involves a one-year attachment of the fellows to HDSS sites to help provide skills for analysis of specific data. Initially, the programme was restricted to Ghana, Kenya and South Africa. It was subsequently extended to all the other countries' sites thanks to increased support from other funders. To date, 13 fellows have been placed in eight different sites (see Annex 3.10 for details). Four of the fellows have been retained by the sites as full-time staff beyond the INDEPTH fellowship period, indicating that the sites value the contribution that the fellows can make to their activities.

Issues to consider

Similar to those associated with the University of Witswatersrand Masters programme; in other word retention at sites and need to define career tracks.

Recommendations

As with the Masters programme, the fellowships need to be placed within a career framework so that eventually opportunity is provided for those capable of proceeding to gain admittance to a PhD programme.

5.3.3 Young scientists travel grants to the Annual General Meeting

Every year an average of fifteen young scientists from sites are sponsored to attend and present posters or talks at the Annual General Meeting. The objective of the sponsorship is three-fold:

1. To give them an opportunity to present their work before an international forum.
2. For the young scientists to listen to senior scientists and their peers from the other sites present in order for them to appreciate the potential that HDSS have as platforms for diverse research studies.
3. To get a chance to initiate interactions with peers and senior scientists within the Network and hence expand the pool of scientific expertise which they can call upon for help in carrying out their research.

Issues to consider

The idea of the grants is highly appreciated within the Network. However, some aspects of the Annual General Meeting (discussed in section 6 of this report) may prevent the recipients from benefiting optimally from attending the Annual General Meeting.

5.4 Enabling sites to participate in cross-site activities

The strength of INDEPTH lies in providing a structure through which research requiring use of resources and data from multiple sites can be carried out. But, as indicated earlier, sites vary considerably in their capacity and hence their ability to participate in cross-site activities. INDEPTH addresses this in two ways as discussed above. A large number of INDEPTH workshops are aimed at strengthening the ability of sites to collect, manage and analyse data for a particular cross-site project e.g. the writing of the INDEPTH fertility monographs. Second, INDEPTH provides funding, through the “small grants programme”, to support sites that come together to develop cross-site activities. Increasingly, INDEPTH is now attracting funding for specific large-scale research projects e.g. MCTA and INESS. In such circumstances, the funding often includes a large allocation to build up the requisite infrastructural and personnel capacities for the project at the participating sites.

Issues to consider

1. Despite the INDEPTH's efforts, weak sites may still fail to meet the basic selection criteria for inclusion in cross-site projects and therefore be unable to take advantage of the support provided for cross-site activities.
2. The large projects bring a lot of capacity-building support with them. This makes them particularly attractive to sites. The process of selecting sites to include in projects needs to be very clear.
3. The capacity-strengthening aspects of the large projects could distort the general capacity-building programme.

Recommendations

While recognizing the need for proper and efficient execution of projects and hence the need for stringent inclusion criteria, there is a need to find ways of rapidly bringing up weak, but clearly willing and enthusiastic, sites to levels where they can compete for inclusion into some of the large projects. This will also need to be placed within the framework of Network's capacity building plans

5.5 Summary

In line with one of its key objectives, INDEPTH has, with considerable success, engaged in an extensive programme of capacity strengthening among its member sites. The programme is certainly valued by those participating in it and by site leaders. Beyond improving individual sites, together these activities have added to the general capacity of the Network to meet other objectives such as conducting multi-site studies, as is evidenced by cross-site products such as the mortality monographs, whose generation was only possible after building the capacity of sites to contribute the required data.

Perhaps due to lack of funding, these activities have hitherto been somewhat reactive to specific needs at a given point in time and slightly haphazard. As the Network grows and more funding becomes available, a more strategic programme should be defined based on short, mid and long term needs and a vision for capacity within the Network. This programme should be informed by the needs of member sites, at one level, and, at a higher level strategically driven by the secretariat, Board and SAC. Such a programme will then guide the annual schedule of short courses and workshops and also the funding priorities for capacity strengthening.

The Network needs to consider moving beyond Masters training to PhD and post doctoral training as a medium and long-term goal for building up scientific leadership within the sites. This needs to be organised within the context of a career framework in order to increase the chances of retaining the students after each stage. Not all sites have the capacity to provide high-quality supervision for PhD training; in such circumstances students from weaker sites could be jointly supervised with a strong site.

There are a number of other capacity building programmes beyond INDEPTH's own that could benefit member sites. The secretariat should try to keep a log of these programmes and encourage the sites to apply. An example of a particularly attractive, albeit very competitive, programme is the Wellcome Trust Masters Fellowship that offers support for a one-year taught course and a further eighteen months of support to do research. The programme is specifically designed for students from developing countries and covers a wide range of disciplines, but with a slant towards public health and field studies.

Finally, both natural growth of the Network and the proposal for strategically planned activities will lead to increased demand for efficient coordination of capacity building activities. Currently most of the activities are coordinated by the Dr. Bawah, who is also the Network's Scientific Coordinator. If the Network is able to secure funds to further expand and develop its training programme along the lines outlined in this section of this report, we recommend that, as part of this process, the secretariat should recruit someone specifically responsible for coordinating capacity-building activities.

6. External relationships

Recognition that health and demographic surveillance sites are important sources of health statistics and research has grown greatly during the past decade and criticism of such sites as lacking value because they are unrepresentative and ineffective is far more muted than it was. INDEPTH is now seen as important actor on the international scene by actors such as the World Health Organization and the Health Metrics Network and has attracted their public support.[3,4] Undoubtedly, these positive developments reflect the existence and activities of INDEPTH as well as of its member sites. Moreover, the existence of INDEPTH and its success at legitimising the idea of HDSS have helped to encourage the establishment of new HDSS in Africa and Asia during the past decade and this has fed back into the growth in the size of the Network itself.

The scientific impact of INDEPTH's activities is considered in section 4 of this report. The impacts on policy and practice of its activities are more diffuse, indirect, and impossible to quantify. Research conducted by INDEPTH sites has often had a substantial impact of health policies and outcomes. Examples include research on use of insecticide-treated bednets for malaria prevention and on the benefits of increasing health care expenditure by $1 a person a year in Tanzania. Moreover, in some instances, documentary evidence exists of INDEPTH's multi-site activities also having had an important impact. For example, INDEPTH's cause-of-death statistics were an important source used by the World Health Organization to produce its most recent burden-of-disease statistics for the African region.[5] These statistics in turn are the foundation for evidence-based global health policy. INDEPTH also worked closely with the Health Metrics Network to develop new international standards for verbal autopsies.[6] However, while the Network has a history of engagement with the World Health Organization and the Health Metrics Network, it has had more limited contacts with other relevant agencies

[3] AbouZahr, C, Cleland, J., Coullare, F., Macfarlane, S. B., Notzon, F. C., Setel, P. and Szreter, S. on behalf of the Monitoring of Vital Events (MoVE) writing group. (2007). Who counts? 4 The way forward. *Lancet*, 370: 1791–99.
[4] Evans, T. and AbouZahr, C. (2008). INDEPTH @ 10: celebrate the past and illuminate the future. *Global Health Action*. DOI: 10.3402/gha.v1i0.1899.
[5] World Health Organization (2008). *The Global Burden of Disease: 2004 Update*. Geneva.
[6] Baiden, F., Bawah, A., Biai, S., Binka, F., Boerma, T., Byass, P. et al. (2007). Setting international standards for verbal autopsy. *Bulletin of WHO,* 85: 569-648.

such as the United Nations Population Fund (UNFPA), United Nations Children's Fund (Unicef), the World Bank, New Partnership for African Development (NEPAD), and so on.

INDEPTH has been active at raising its profile within the scientific community by attending international conferences to showcase the Network's activities and publications. For example, it both manned a stall and organized a scientific session based on the Network's research at the 2009 International Population Conference of the International Union for the Scientific Study of Population. So far, however, INDEPTH has put less effort into developing institutional linkages with the leaderships of other scientific networks and associations or developing joint activities with them.

Issues to consider

INDEPTH needs to build on its success in legitimating HDSS by developing a reputation for the Network and its members as effective suppliers of high-quality health statistics able to inform health policy. As mentioned in section 3, external communications are an area in which many member sites believe that the performance of the secretariat needs to improve. This is in part because the position of Communications Manager has fallen vacant after the departure by mutual agreement of the previous appointee.

One obstacle to recruiting an appropriate Communications Manager is that many individuals with a training in this general area are more oriented to communicating information to the broadcast and print media than to a scientific and professional audience working in development agencies, government, universities, and so on. Moreover, understanding and communicating the findings of scientific research and their policy implications is something that many professionals will find difficult if they completely lack any background in scientific research themselves. Moreover, communication with stakeholders outside the Network requires an understanding of the global health and research landscape in order to be able to market INDEPTH as a partner and potentially important player in international health endeavours.

Developing strategies for presenting INDEPTH and its research to external stakeholders that better communicate its achievements and potential is a demanding challenge that will require the involvement of the Executive Director as well as the Head of Communications. Some of the organisations that specialise in communicating development research to policy makers,

such as the Overseas Development Institute in London, have developed valuable resource materials concerning the process and also provide advisory services.

Recommendations

INDEPTH as a network needs to direct its communications activities toward a wider range of international stakeholders. It should develop a medium-term strategy for engagement with not just the World Health Organization but the entire range of relevant United Nations agencies and development banks. Initially, the aim should be to establish ongoing relationships with them and prove the Network's value as a source of policy-relevant data and research, rather than seeing any of these organisations as sources of funding in the short-term.

Another aspect of its external relationships on which INDEPTH could place more emphasis is building alliances with the large number of scientific networks and associations that exist with missions relating to that of INDEPTH, such as the International Union for the Scientific Study of Population, epidemiological associations such as the International Epidemiology Association (IEA) and International Clinical Epidemiology Network (INCLEN), various disease-specific and trials networks, etc. In the context of limited resources, it is inevitable that INDEPTH will at times find itself competing for funding with some of these organisations. Where possible though, INDEPTH should aim to develop linkages with them based on complementarities of interest. For example, in some instances setting up a scientific Working Group jointly with another organisation might make it more attractive to funders than would be the case if either organisation acted in isolation. Moreover, apart from the value that such collaborations may add to INDEPTH's activities, working together with such organisations can also inform INDEPTH's understanding of the evolving research and health policy agenda and thus enable the Network to better define a competitive niche for itself. As suggested in section 3.5, it might be appropriate to invite members of the boards/councils of certain key organisations to sit on the SAC.

At the national level, the role of the Network should be to assist those sites that do not have them to build strong relationships with stakeholders such as Ministries of Health, National Statistical Organisations, and universities. Building sites' ability to interact productively with these stakeholders is an area for capacity development that has received insufficient attention until now. While there is probably not a specific set of teachable skills for this goal, the Network has a wealth of experience distributed among the sites. Many sites, each following a unique model, have established working relationships with national-level stakeholders such as

the Ministry of Health or National Statistical Organisation. This has enabled these sites to provide input into the health and demographic information systems of their own countries and thereby feed into the evidence base for public health policies. These experiences and models need to be documented and the sites brought together to share their experiences. This process should proceed in parallel with workshops and continuing support for sites to develop policy briefs.

Despite the limited research productivity of many universities in developing countries, in most contexts they remain the main permanent organisational base in which to build a tradition of high-quality scientific work. Stronger collaborations between INDEPTH sites and their local universities could often be of mutual benefit. These might involve senior scientists in sites holding honorary university posts and university faculty contributing to the sites' research programme. HDSS sites can provide postgraduate research students with the field study sites and a level of research infrastructure that many universities lack; the universities can provide classroom-based skills training, accreditation for the students' studies, and award degrees. The sites benefit in the short term from the additional scientific manpower represented by the students and in the longer term from strengthening the training programmes from which they can recruit staff. In addition, such collaborations can buttress sites' request for funding from national institutions.

As a network, INDEPTH already has collaboration with a number of Southern universities (e.g. the University of the Witwatersrand in South Africa, which runs the INDEPTH Masters programme, and the Regional Institute of Population Studies at the University of Ghana). These links or similar one would need to be developed if the Network considers developing a doctoral training programme. Thus, the secretariat is encouraged to pursue the opportunities arising from initiatives aimed at strengthening universities in developing countries such as the Wellcome Trust's African Institutions Initiative to strengthen research capacity.

Finally, the secretariat needs to actively manage its relationships with funders in a more strategic and long-term way. Above all, any problems that result from failures of communication, such as the unilateral viring of resources, must be eliminated. The different organisations funding INDEPTH have diverse missions and are interested in funding different aspects of the Network's activities. Therefore, the secretariat needs to plan their fund-raising activities with an eye to the longer term. They need to monitor internal shifts in the policies of each funder and engage in ongoing discussions with each them concerning the evolution of

the Network's portfolio of activities and potential future contribution that each funder might make to that portfolio. Thus, each application for funding should be justified not just on its own merits, but also in terms of how it contributes to a more ambitious programme of activities.

7. Overall assessment

During the past decade the INDEPTH Network has established itself as a credible Southern-led organisation able to operate successfully, managing large budgets, coordinating an extensive programme of cross-site research and capacity development activities, and establishing governance mechanisms that ensure its accountability to its members and other stakeholders. It has benefited since its inception from strong leadership at the Board level, in the secretariat, and in the Scientific Advisory Committee. Like any network, INDEPTH has to deal with inherent internal tensions, for example between well-resourced and weaker member sites, between sites based in Africa and in Asia, and between different views as to the functions of the secretariat. Unlike some similar networks, INDEPTH has been largely successful at managing these tensions.

Based on the analysis in the previous sections of this report, we summarise some of the key achievements and weaknesses of the INDEPTH in the following table in the form of an analysis of a SWOT analysis.

Subject Area	Strengths	Weaknesses	Opportunities	Threats
Organisation and governance	Board comprises people with real interest in and understanding of the Network Lean secretariat with competent personnel and strong leadership SAC has a vast wealth of knowledge in research and public health issues	Internal and external communications Excessive Anglophone bias Diffuse and devolved scientific leadership SAC's functions and operating procedures are ill-defined	Use of new web-based technologies to enhance communication between the secretariat and sites and between sites Better use of SAC to assist sites and identify and leverage the Network's research strengths	Lack of succession plan for the Executive Director secretariat at risk of getting too lean and stretched Sustainability depend on securing core funding Conflicts of interest between the Network's goals and Board members' site's goals
Scientific activities	The Network holds a very large collection of longitudinal demographic and health data facilitating comparative studies	Few urban HDSS and regional bias Activities not informed by an overarching scientific strategy Success of the cross-site activities depends on the	HDSS data from most sites remain under-exploited Strong demand for research on cause-specific mortality Increased emphasis in the scientific community on the	Low scientific productivity Lack of time among senior scientists in sites to take on Network activities Failure to focus on strategically important research

	Activities driven by sites and hence have buy in from start Attractive platform for other health research studies	commitment of the Working Group leaders Differential capacity among sites hinders participation by some sites Data documentation and comparability of data between sites Policy on data sharing still lacking	importance of longitudinal data for hypothesis testing Data sharing has the potential to raise awareness of the value of HDSS data, increase the use made of them and buttress the case for ongoing funding	questions Lack of core funds in a number of sites Inability or unwillingness of sites to share data. Risk of overstretching the capacity of the secretariat for scientific coordination
Capacity building	Extensive experiences and expertise on HDSS matters can be shared between sites	Lack of a comprehensive framework for capacity-building activities	Increase sustainability of sites and thereby INDEPTH by building scientific capacity that attracts funding	Sustainability dependent on continued funding Retention of personnel after training Risk of overstretching the capacity of the secretariat to coordinate training activities
Networking	Strong south-south collaborative venture	Unequal regional representation	Focus on neglected areas such as Central Africa for further growth	Loss of cohesiveness with growth
Interactions with external stakeholders	INDEPTH Network is now known and well respected as a Southern-based HDSS network Interest in HDSS data and their potential contribution to health policy remains high	Executive Director too over-burdened with administrative responsibilities to engage fully in international activities Capacity for packaging results into policy briefs and building alliances to influence policy remains low No clear way of measuring impact of INDEPTH research on health policy	Potentially a key partner in the emerging global collaboration on health metrics and evaluation Sites can draw on each others expertise to develop interactions with other health stakeholders INDEPTH outputs currently underused as an advocacy tool for international health policy	Loss of credibility due to failure to produce basic demographic statistics Pressure to meet other stakeholders' goals, especially if they provide significant funding

In relation to its own four strategic objectives, INDEPTH has been perhaps most successful at developing research capacity within member sites. Second, it has also done much to provide

resources that improve the ability of sites to conduct health and demographic surveillance, with the notable exception that it is only now getting to grips seriously with the interrelated series of issues to do with data sharing, creation of metadata, simplifying the extraction of rectangular analytic datasets from full HDSS databases, and increasing the cross-site comparability of the analytic variables. Third, while the Network has been reasonably successful at stimulating and coordinating multi-site research studies, the impact of this has sometimes been limited by inadequate analytic capacity in the participating sites. Finally, although the Network has done much to establish both its own credibility and that of health and demographic surveillance of localised populations over the last decade, it needs to build on this achievement by doing more in future to facilitate translation of its findings to maximise impact on policy and practice.

In order to achieve maximum scientific and policy impact from their HDSS and secure their future, INDEPTH and its member sites need to collect high-quality health and demographic surveillance data, analyse these data to produce important findings, and make standardised data series and datasets available to the wider scientific community. Ultimately, poor data quality is a more profound threat to INDEPTH than lack of analytic capacity. Thus, INDEPTH needs to gradually assume a quality assurance role, so that it can guarantee the quality of the statistics and datasets generated by member sites.

While this is not one of INDEPTH's own priorities at present, our document review and interviews indicate that the primary output that most scientists and international agencies look to INDEPTH to provide is a set of timely, regularly updated, and reliable series of cause-of-death statistics for as many sites as possible based on their verbal autopsy data. Some of these stakeholders also want access to the detailed data from the verbal autopsy questionnaires, so that they can assess the robustness of INDEPTH's own cause-of-death statistics and explore the implications of using alternative procedures for coding causes of death.

Use of non-comparable verbal autopsy instruments and coding procedures and delays in the coding, analysis, and publication of these data represent a threat to INDEPTH that is disproportionate to the resources that are required to resolve these issues. The Network and its member sites would greatly enhance their global standing as providers of strategically important health data if they began to produce simple descriptive data on causes of death in a timely way. Moreover, much of the frustration of some stakeholders with the Network, the bad press it receives from some quarters, and the pressure it comes under concerning data

sharing would evaporate. Thus, INDEPTH should regard this issue as of high priority. By contrast, most analysts who wish to access HDSS data to test causal hypotheses, undertake risk factor epidemiology, or evaluate the impact of interventions want to work collaboratively on the data from single sites.

One characteristic of the Network that is both a strength and a weakness is that scientific leadership within INDEPTH is diffuse and devolved. The Network as a whole is not signed up to a clearly articulated vision of its scientific priorities. As mentioned in section 3.4, many site leaders and other senior member of the Network espouse the principle that scientific leadership should come from the sites and that the secretariat's role should be restricted to scientific coordination. This conception of the Network combined with the Working Group mechanism has served INDEPTH well in developing its programme of research and has not prevented it from raising major research grants such at those for MCTA and INESS. On the other hand, a bottom up approach to developing the Network's work programme is unlikely in itself to maintain a focus on strategic issues such as those just discussed, especially if addressing them requires sites to admit their own weaknesses or if their short-term and long-term interests diverge. Equally, the secretariat is currently too small and staffed with too few scientists to be able to identify, obtain funding for, and lead major projects without the involvement of senior staff from member sites.

Lastly, INDEPTH remains entirely focused on health and demographic research. While it has undertaken one major study of health inequalities, it is only beginning to directly address research issues related to social policy and has not yet focused on research related directly to the primary Millennium Development Goal of reducing poverty.

8. Recommendations

This section summarizes the main recommendations arising from this review. Some of the recommendations involve changes in policy or reorientation of aspects of the secretariat's operations and its interactions with members of the Network that do not require substantial additional resources. Other recommendations, including some key ones, could not be implemented without the injection of new resources. In a few instances, substantial additional funds would be required. The final recommendation highlights these potential new and expanded areas of activity.

8.1 Governance and administration

1. So as to avoid potential conflicts of interest, the Network should consider appointing an independent Chair of its Board of Trustees from outside the Network.
2. To strengthen its secretariat, the Network should appoint a Deputy Director either by internal promotion or external recruitment.
3. The Network should fill the vacant post of Communications Manager as a matter of urgency, possibly appointing someone who is also capable of serving as Deputy Director.
4. Once a Communications Manager has been appointed, INDEPTH should review both its internal and external communications strategies, including the design and content of its website.
5. Certain internal and external documents, including some of the website, should be made available in French and Portuguese as well as English
6. The constitution, composition, role, and reporting arrangements of the Scientific Advisory Committee should be revised and further developed.

8.2 Financial

7. INDEPTH should maintain adequate reserves to cover the core costs of running the Network for at least one year even if one or more of its major grants is not renewed.
8. INDEPTH should pool members' experience of mechanisms for obtaining contributions to the costs of running an HDSS from research projects that use it as a platform on which to mount other scientific studies and perhaps develop a common policy on such contributions.

8.3 Scientific activities

9. As a medium-term goal, INDEPTH should aim to adopt a quality assurance role with regard to the reliability and validity of HDSS data generated by member sites.
10. The Network should establish a data administration committee to be responsible for the Network's policies and technical strategies concerning data archiving, extraction and sharing and to provide advice to member sites.
11. INDEPTH must agree a policy on data sharing and do more to support sites to document, archive and share their HDSS data.
12. INDEPTH needs to articulate an overall vision of its scientific aims and research priorities, informed by an analysis of the comparative strengths of HDSS data, that can guide it in focusing on scientific activities aligned with the Network's medium-term objectives.
13. Based on this vision, the Network should develop a realistic scientific work plan against which its progress could be evaluated in future reviews.
14. INDEPTH should focus administrative and financial support on those Working Groups whose activities are consistent with this scientific strategy and work plan.
15. As one medium-term scientific objective, INDEPTH should encourage member sites to further leverage the value of their longitudinal, population-based data by developing a broader economic and social research agenda addressing the full spectrum of development issues that are targeted by the Millennium Development Goals.
16. Although leadership within the Network is dispersed, leadership of large funding bids cannot be. They must be championed by leaders with a strong personal commitment to the project activities who can articulate the vision underlying the proposals.
17. While continuing to ensure that overall leadership of its scientific activities remains within the Network, INDEPTH should seek to develop stronger research collaborations with outside scientists from both Southern and Northern institutions.

8.4 Capacity building

18. The secretariat needs to ensure that the Network's resource kits are kept up-to-date, using web-based technologies such as wikis to facilitate this.
19. The Network should develop a more strategic capacity-strengthening programme addressing its short-, mid- and long-term needs.

20. An audit of capacity in each the member sites should be conducted periodically in order to identify gaps and facilitate the development of a comprehensive capacity-strengthening programme.
21. The secretariat needs to timetable its annual programme of workshops well in advance so that site leaders can plan the development of their staff.
22. The criteria and the process of selection of workshop participants need to be clearly communicated – selection has to be seen to be fair.
23. The University of the Witswatersrand Masters degree and INDEPTH fellowships programmes need to be placed within a career framework that provides graduates with opportunities to use their new skills and to develop them further.
24. The Network should consider moving into PhD and post-doctoral training in order to build up scientific leadership within the sites.
25. If the Network is able to secure funds to further expand and develop its training programme, as part of this process, the secretariat should either provide the Research Coordinator with more assistance in this area or recruit someone to be specifically responsible for coordinating the Network's capacity-building activities.

8.5 External relationships

26. INDEPTH should refocus on its aim to communicate the Network's research findings to external stakeholders and maximise their impact on policy and practice.
27. The Network should develop stronger relationships with the entire range of international agencies potentially interested in its work with the aim of demonstrating to them the Network's value as a source of policy-relevant data and research.
28. INDEPTH should build alliances with other scientific networks and associations with related missions.
29. INDEPTH should do more to assist sites to build strong relationships with Ministries of Health, National Statistical Organisations, and local universities.
30. The secretariat needs to manage its relationships with funders in a more strategic way, justifying individual applications for funding not just on their own merits, but also in terms of how they contribute to the Network's entire programme of activities.

8.6 Recommendations to member sites

31. To enhance their own and the Network's scientific reputations, all member sites should adopt standardised procedures for verbal autopsies and the coding of causes of death as the basis for an annually-updated series of statistical reports from INDEPTH.
32. Site leaders should contribute to building up the scientific prestige of the AGM by encouraging colleagues with important results or with research that showcases their HDSS to submit abstracts (and by doing so themselves).

8.7 Recommendations to Sida and other funders

33. Sida's funding of a proportion of INDEPTH's core costs and capacity-strengthening activities has leveraged and complemented the funding of research projects by other organisations and should be continued.
34. Other funders should recognise that the secretariat exists very largely to administer the grants made to the Network by a handful of organisations. The core salary and other costs involved in maintaining the Network's secretariat are almost entirely directly attributable to its various projects. The sustainability of INDEPTH's programme of activities can only be assured if the Network's major funders take on responsibility for an appropriate share of the funding for the secretariat that administers their grants.
35. The following recommendations would require significant additional resources and we recommend that funding applications from INDEPTH linked to these recommendations be favourably considered:

    (2) Appointing a Deputy Director to strengthen the secretariat.

    (9) Developing a quality assurance role with regard to member sites' HDSS data.

    (11) Supporting sites to document, archive, and share their HDSS data.

    (15) Supporting sites to develop a broader economic and social research agenda.

    (19) Developing a more strategic capacity-strengthening programme, (23) placing existing activities in a career framework, (24) moving into PhD and post-doctoral training, and (25) recruiting new staff to coordinate the Network's capacity-building activities.

    (26) – (29) Improving communications with external stakeholders.

Annex 1: Terms of reference for multi-funder external review of the INDEPTH Network to start in October 2009

Background information on the INDEPTH Network

INDEPTH is a network of currently 37 sites in 19 developing countries in Asia, Africa, Oceania and Central America. INDEPTH sites are continuous surveillance systems in resource-poor communities that generate evidence on important health, population and social issues.

INDEPTH's vision

INDEPTH will be an international platform of sentinel demographic sites that provides health and demographic data and research to enable developing countries to set health priorities and policies based on longitudinal evidence. INDEPTH's data and research will guide the cost-effective use of tools, interventions and systems to ensure and monitor progress towards national goals.

INDEPTH's mission

To harness the collective potential of the world's community-based longitudinal health and demographic surveillance initiatives in resource constrained countries to provide a better, empirical understanding of health and social issues, and to apply this understanding to alleviate the most severe health and social challenges.

INDEPTH's Key Objectives:

- To support and strengthen the ability of INDEPTH sites to conduct longitudinal health and demographic studies in defined populations.
- To facilitate the translation of INDEPTH findings to maximise impact on policy and practice.
- To facilitate and support research capability strengthening relevant to INDEPTH activities.
- To stimulate and co-ordinate multi-site applications to research funding bodies for specific research activities.

External review

Since the formal constitution of the INDEPTH Network in 2002, INDEPTH has not undergone an external review.

What has taken place is a financial and organisational assessment of INDEPTH (Gutberg, 2007) that concludes the need to strengthen financial routines and project reporting but noted that the lack of development in this area is mostly due to the rapid growth of the organisation. Further, the development of strategic plans for the Network, involving external consultants who go through rigorous processes. These processes have always involved SWOT analysis. INDEPTH's second strategic plan 2005-2009 ends in 2009 and a process has already been put in place to develop its third for the period 2010-2014. Dalberg Global Business Consultants are currently helping the Network to develop the new strategic plan. In 2007, INDEPTH's business plan was also developed with the help of external consultants.

The INDEPTH Leadership and partners are cognisant of the fact that as an independent international organisation, INDEPTH should ensure continued external review of its future activities to ensure objectivity, greater effectiveness, efficiency and transparency.

Sida/SAREC has supported INDEPTH since 2002 and has recently increased core support to the Network to 10 MSEK/year. The ongoing agreement covers 2009-2012. The reason why Sida is

commissioning an external review is partly because this was requested by Sida's Research Committee in late 2008 as a precondition for continued support and thus the current agreement includes an evaluation to be made during 2009. Secondly, it is Sida's policy to regularly evaluate the organisations receiving support from Sida. However, this review will cover all activities performed by INDEPTH, well beyond Sida supported components. Sida will bear the financial costs involved. The other funders have contributed to the formulation of the present TOR and will participate in providing information to reviewers and in discussions about the findings and in the follow up of recommendations.

Purpose and scope of the review

The purpose of the review is to assess the relevance, efficiency, effectiveness and impact of INDEPTH in relation to its stated mission and functional structures and operating environment from 2002 until now and also in the future.

The scope of the review is to focus on future direction and management of the programmes resulting in concrete and realistic recommendations, especially regarding programme activities, interaction/collaboration with other key stakeholders in the area of health and demographic surveillance in resource-poor countries.

The assignment (issues to be covered by the review)

The consultants should evaluate the following:

Achievements in relation to its mission and the continued relevance

- Assess INDEPTHs national, regional and global achievements[1] since 2002 including the possible direct and indirect effects and impacts
- Assess and make recommendations on the continued relevance of INDEPTH including its mission and vision and strategies considering the changes in the external environment that have been taking place the last years.
- Based on above information, reflect on the comparative advantages of INDEPTH in relation to other partners and provide some inputs for the way forward to enhance future relevance and performance.

Organisational and funding issues

- Implementation of recommendations made by Gutberg in his financial and organisational assessment
- Major impediments to the mission and key objectives of INDEPTH
- Long term sustainability of the Network.
- A discussion of the quality issues and whether there needs to be criteria set for membership of the Network.
- Setting goals and targets that are measurable.

[1] Achievements/results

- Relevance – the extent to which the objectives of INDEPTH are consistent with the local, national, regional and global needs.
- Effectiveness – The extent to which INDEPTH's objectives have been achieved or will in the future (is the programme on track?) in a sustainable fashion and with a positive institutional development impact
- Efficiency – the extent to which the costs of the activities can be justified by the results.
- Impact – what are the overall short-term and long-term effects of the programme

- Definition of a Core activity for the Secretariat; including an assessment of
    a. INDEPTH Communications with respect to advocacy, dissemination of products, keeping donors and partners informed, maintaining good and continuous links with its network of DSS sites;
    b. INDEPTH efforts with respect to Knowledge Translation and Exchange both to advocate for its network of DSS sites, to disseminate its research findings and evidence to a wide array of stakeholders and to encourage the use of its evidence/products to inform health policy debates at national, regional and international levels;
    c. the strengths, weaknesses and opportunities of INDEPTH's fund raising efforts both for the Network itself, multi-site studies and fund raising for its network of DSS sites; as well as
    d. the core professional staff composition and adequacy/skills mix/skills gaps with respect to future demands articulated in the strategic plans.

Collaboration/Cooperation and Internationalisation

- To what extent is INDEPTH collaborating/cooperating with international organisations such as WHO, HMN.
- In what way is INDEPTH collaborating with MoH in the countries in which INDEPTH sites are located so as to influence policy development.
- In what way is INDEPTH collaborating with the universities and other research institutions in developed and resource-poor countries?
- Give concrete recommendations on how and in which areas collaboration/cooperation with above mentioned key stakeholders could be enhanced.
- Elaborate on the scope of INDEPTH. What are the obstacles, challenges and possibilities?

Methodology, evaluation team and time schedule

It will be carried out by 2 persons. The consultants should read previous reports, evaluation and memorandum from Sida and review other relevant documents. The review methodology will build on OECD/DAC's Evaluation Quality Standards.

Distribution of tasks between the two consultants

1. One consultant will assess the relevance, effectiveness, impact of INDEPTH's **scientific activities** including studies on mortality, malaria, health equity, sexual and reproductive health, migration and urbanization, adult health and aging, climate change and health, ART etc. The issue of data sharing and access plan should also be covered in this perspective.

2. The second consultant will focus on relevance, effectiveness, impact of INDEPTH's activities in relation to **capacity strengthening** initiatives including Scientific Development and Leadership Programmes, INDEPTH Fellowship Programme, workshops, inter-sites collaboration processes etc. as well as career development issues for specialists within the Network.

3. Questions regarding Organisational and funding issues as well as Collaboration / Cooperation and Internationalisation - being of cross-cutting nature, will be dealt with jointly by both consultants. Such issues indeed correspond to the general environment within which scientific and capacity strengthening objectives are being pursued.

Time plan

Given the broad geographic coverage of INDEPTH and the need to consult country partners, it is anticipated that the review will require 24 days to complete. It is expected that the evaluation team

begin work in October 2009 and submit a draft in mid-December 2009. A final report will be prepared within two weeks of the debriefing of interested parties which will be held before 31 January 2010.

- *Visit to Sida:* The consultants should visit Sida/GLOBFORSK for an introduction: 22 – 23 October

- *Participation in INDEPTH Annual General Meeting (AGM)), including field visit in Vadu, Pune, India,:* 24 – 31 October

- *Field visit to Iganga HDSS, Uganda:* 13 – 17 November

- *Field visit to Ifakara HDSS, Tanzania:* 18 – 20 November

- *Visit to INDEPTH Secretariat* in Accra*:* 23 – 25 November

- *Presentation of findings in seminar at Sida in Stockholm:* 26 January (by Prof I Timaeus)

- *Presentation of findings to INDEPTH Board:* next board meeting/electronically (by Dr S Kinyanjui)

- *Final report due by* 9 February 2010.

The consultants will make their own travel arrangements. The visits will be facilitated through contacts from GLOBFORSK and INDEPTH.

Reporting

The report should be written in English and the format and outline of the report shall follow the guidelines in Sida evaluation report – a standardised format (see annex).
The evaluation report will include the following:

- Based on what is found regarding the above mentioned points, give concrete and realistic recommendations for improvements
- Conceptual and practical lessons learned in the process of commencing operations at INDEPTH
- Recommendations for the strategic direction of the INDEPTH to be considered in the Strategic Plan 2010 – 2014 currently under development by the Network.

The report will be judged according to OECD/DAC's Evaluation Quality Standards.

Annex 2: Methods used for the review

The review was conducted by two consultants between late October and Christmas 2009. During these two months the team devoted about 75 per cent of their time to the review. The draft report was revised in late January and February 2010 in response to feedback from Sida and INDEPTH.

The four thematic areas were evaluated on the basis of the review of documents, the observation of Network activities, and interviews with internal and external stakeholders. In more detail, we undertook:

1. A review of documents that reflect INDEPTH's *activities*, including both published documents, such as annual reports, strategic plans and reports from workshops, and internal documents, such as minutes of meetings and administrative manuals.
2. A review of documents that reflect the Network's substantive *outputs*, such as policy briefs, scientific papers and research monographs.
3. A review of citation data for the research publications resulting from multi-site projects coordinated by the Network in order to assess their scientific impact.
4. A review of INDEPTH's website.
5. The observation of the 2009 General Assembly of INDEPTH, the annual Site Leaders meeting, the annual meeting with representatives of the funders, and a meeting of the Scientific Advisory Committee.
6. In-depth interviews with the secretariat, members of the Board, and members of the Scientific Advisory Committee in order to understand the operations of the Network, the rationale and philosophy behind the Network's activities, challenges to the Network, and the strategic thinking of its leadership concerning the Network's future.
7. Semi-structured interviews with the majority of site leaders in order to obtain their views on the operation of the Network, the beneficial impacts that membership of the Network brings to their sites, and any areas in which they felt the Network was failing to realise its potential.
8. Semi-structured interviews with scientific, information-technology, and administrative staff from member sites who had participated in one or more INDEPTH activities (e.g.

attended training workshops, completed the Masters programme at the University of the Witwatersrand, or participated in scientific working groups) in order to obtain their views on the organisation and relevance of these activities and their ongoing impact on their work.

9. Interviews with external stakeholders, including academic researchers from both Northern and Southern institutions, members of the secretariats of organisations funding the Network, senior medical personnel in the health districts where the sites that we visited are located, and staff from health agencies such as the World Health Organization, in order to get their perception of INDEPTH's effectiveness and impact and of the contribution it is making to the global health landscape.

Reliability was ensured through cross-validation and critical assessment of the sources used. In total, the team individually or jointly interviewed more than 80 informants. Toward the end of the interviews we assessed that process had nearly reached saturation in that we were no longer encountering many new issues or novel points of view.

Individuals who we interviewed were assured that their comments would only be used for the report unattributably. This encouraged informants to speak freely and undoubtedly increased the value of a number of the interviews that we conducted. We do not feel that this promise in any way constrained us from saying what we wished to in this report. In line with this promise of anonymity, we have not included a list of those we interviewed in the report.

This review process was assisted by arranging its onset to coincide with the 2009 INDEPTH Annual General Meeting at Pune, India. This enabled the reviewers to participate in the meeting and interview a large number of site leaders, Board and SAC members, and other stakeholders as well as staff from the host site. This trip was supplemented by visits to three African HDSS member sites to meet with staff who did not attend the 2009 Annual General Meeting but who had had past contacts with INDEPTH and by visits to the secretariat's offices in Accra, Ghana and Dar es Salaam, Tanzania.

The INDEPTH sites visited for this review were selected in part to keep down costs, as the team intended to visit India and Ghana anyway to attend the INDEPTH's 2009 Annual General Meeting and visit the secretariat's main office respectively, but also to reflect some of the diversity between INDEPTH sites. They vary in their location, in how long ago they were founded, in the institutional context within which the HDSS operates, and in the

resources available to them. Among the four sites, Vadu in India was included as a representative of INDEPTH's Asian sites whose staff could be interviewed in conjunction with our attendance at the Annual General Meeting. The HDSS was established in 2002 in the context of a rural health programme that had been in operation since the 1970s. Rufigi HDSS in Tanzania is a well-established site that commenced field operations in 1998. Organisationally, it is a sister site to the Ifakara HDSS. Iganga/Mayuge in Uganda only commenced field operations in 2005. Unlike the longer established HDSS that we visited, this site could take advantage of manuals and documents developed by INDEPTH and technical assistance organised through the Network to assist it in setting up its operations. While Vadu and Rufigi are run by independent research institutes, Iganga/Mayuge is part of Makerere University. Kintampo has existed as a research centre since 1994 but started its HDSS in 2003. It is one of three HDSS established by the Ghana Health Service.

The secretariat compiled the data on INDEPTH's activities and outputs that are listed in Annex 3. We are grateful to them for this and for providing us with logistical support during the review. We also thank the secretariat and the leadership of INDEPTH for adopting a constructive and open approach to the review process and for agreeing to have the team sit in on all the various internal administrative and electoral meetings of the Network that took place at its 2009 Annual General Meeting with the exception of the meeting of the Board of Trustees. We particularly thank all the individuals inside and outside INDEPTH who agreed to be interviewed, including the staff of the four sites that we visited.

Before it was finalised, a draft of this report was circulated for comment and correction of factual inaccuracies to INDEPTH's secretariat, to its Board of Trustees, to Sida, and to the senior management of the four HDSS sites that we visited. We received detailed written feedback on the draft from both Sida and INDEPTH and responded to these comments by making a number of revisions and additions to the report.

Annex 3: INDEPTH Network – activities and outputs

A3.1 INDEPTH Network – member sites, 2010

Abhoynagar, Mirsaarai, Kamalapur (Bangladesh)	Kintampo (Ghana)
ACDIS (South Africa)	Kisumu (Kenya)
Agincourt (South Africa)	Magu (Tanzania)
Ballagbarh (India)	Manhica (Mozambique)
Bandafassi (Senegal)	Mbita (Kenya)
Bandim (Guinea Bissau)	Matlab (Bangladesh)
Butajira (Ethiopia)	Mekong (Cambodia)
Chililab (Vietnam)	Mlomp (Senegal)
Chakaria (Bangladesh)	Nairobi (Kenya)
Dikgale (South Africa)	Navrongo (Ghana)
DodoLab (Vietnam)	Niakhar (Senegal)
Dodowa (Ghana)	Nouna (Burkina Faso)
Filabavi (Vietnam)	Purwore (Indonesia)
Ifakara (Tanzania)	Rakai (Uganda)
Iganga/Mayuge (Uganda)	Rufiji (Tanzania)
Kanchanaburi (Thailand)	Sapone (Burkina Faso)
Karonga (Malawi)	Vadu (India)
Kilifi (Kenya)	Wosera (Papua New Guinea)
	West Kiang (Kenya)

A3.2 Summary of grants to the INDEPTH Network, 2007-2010

Funder	Period	Project
CIDA	2008	Contribution to AGM 2008
DFID	2005-2010	TARGETS Consortium
	2005-2010	Realising Rights: Improving Sexual & Reproductive Health
Gates Foundation	2005-2007	Scientific Leadership Programme
	2006-2009	Malaria Clinical Trials Alliance
	2007-2008	Proposal Development (Phase IV Consortium)
	2008-2009	General Operating Support Grant
	2008-2010	INESS Project
Hewlett Foundation	2006-2008	HDSS/University Collaboration
	2008	Organisational Effectiveness Program
	2008-2010	General Operating Support
	2008-2009	Evaluation of Reproductive Health Interventions
	2008	Monitoring and Evaluation Support Grant
	2008	Expanding Data Sharing Project
	2010	Data Sharing Initiatives
IDRC	2008-2010	Demographic Transitions
Rockefeller Foundation	2002-2007	Institutional Core Support
	2006-2008	Scientific Leadership and Development Programme
	2009-2010	General Support Grant
Sida	2004-2008	Institutional Core Support
	2009-2010	Institutional Core Support
Wellcome Trust	2007-2009	Institutional Core Support
	2006-2007	Support to AGM 2006
	2007	INDEPTH Data System
WHO/NIA (SAGE)	2005-2008	Adult Health and Aging

A3.3 Bibliography of INDEPTH Publications

i) Monographs

INDEPTH Network [Sankoh O. et al. (eds)] (**2002***). Population and Health in Developing Countries. Volume 1: Population, Health and Survival at INDEPTH Sites*. International Development Research Centre, Canada.

INDEPTH Network [Lead Authors: Ngom, P., and Bawah, A.] (**2004**). *INDEPTH Model Life Tables for Sub-Saharan Africa*. Ashgate Publishing Limited, England.

INDEPTH Network (**2005**). *Measuring Health Equity in Small Areas: Finding from Demographic Surveillance Systems*. Ashgate Publishing Limited, England.

Ye, Y., Sankoh, O., Kouyate, B. and Sauerborn, R. (**2008**). *Environmental Factors and Malaria Transmission Risk: Modelling the Risk in a Holoendemic Area of Burkina Faso*. Ashgate Publishing Limited, England.

Collinson, M., Adazu, K., White, M. and Findley, S. (**2009**). *The Dynamics of Migration, Health and Livelihoods: INDEPTH Network Perspectives*. Ashgate Publishing Limited, England.

ii) Chapters in edited volumes

Sankoh, O. and Binka F. (**2005**). INDEPTH Network: a viable platform for the assessment of malaria risk in developing countries. In Takken W., Martens P. and Bogers R. J. (eds), *Environmental Change and Malaria Risk – Global and Local Implications*. Berlin, Heidelberg: Springer Verlag

Sankoh, O. and Binka, F., on behalf of the INDEPTH Network (**2005**). INDEPTH Network: Generating Empirical Population and Health Data in Resource-constrained Countries in the Developing World. In Becher H. and Kouyate B. (eds), *Health Research in Developing Countries*. Berlin, Heidelberg: Springer Verlag.

Sankoh, O., Ngom, P., Clark, S. J., Savigny, D. and Binka, F. (**2006**). Levels and Patterns of Mortality at INDEPTH Demographic Surveillance Systems. In D. T. Jamison, R. G. Feachem, M. W. Makgoba, E. R. Bos, F. K. Baingana, K. J. Hofman, and K. O. Rogo (eds). *Disease and Mortality in Sub-Saharan Africa*. Second Edition. Washington, D. C.: The World Bank.

iii) Journal supplements

INDEPTH Network (**2009**). *Risk factors for chronic non-communicable disease: the burden in Asian INDEPTH Health and Demographic Surveillance Sites*. (Bonita R, ed) *Global Health Action*, Supplement 1 (2009).

iv) Journal articles

Ngom P., Binka F.N., Phillips J.F., Pence B. and Macleod B. (**2001**) Demographic surveillance and health equity in sub-Saharan Africa. *Health Policy and Planning* **16**: 337–344.

Setel P.W., Sankoh, O**.**, Rao, C., Velkoff, V.A., Mathers, C., Gonghuan, Y., Jha, P., Sethi, R.C., Hemed, Y. and Lopez, A. (**2005**). Sample registration of vital events with verbal autopsy: innovative approaches to measuring and monitoring vital statistics. *Bulletin of the World Health Organization*, **83**(8): 611-7.

Adjuik, M. Smith, T., Clark, S., Todd, J., Garrib, A., Ashraf, A. et al. (**2006**). Cause-specific mortality rates in sub-Saharan Africa and Bangladesh. *Bulletin of World Health Organization*, **84**(3): 181-192.

Bawah, A.A. and Binka, F.N. (**2007**). How many years of life could be saved if malaria were eliminated from a hyperendemic area of Northern Ghana? *American Journal of Tropical*

Medicine and Hygiene, 77 (Supplement 6): 145-152

Salim A., Adazu, K., Masanja, H., Diallo, D., Hodgson, A., Ilboudo-Sanogo, E., Nhacolo, A., Owusu-Agyei, S., Thompson, R., Smith, T. and Binka, F.N. (**2007**). Patterns of age-specific mortality in children in endemic areas of Sub-Saharan Africa, *American Journal of Tropical Medicine and Hygiene*, 77(Suppl 6), pp. 99–105.

Bawah, A.A., Phillips, J.F., Adjuik, M., Vaughan-Smith, M., MacLeod, B. and Binka, F.N. (**2010**). The impact of immunization on the association of poverty with child survival: evidence from Kassena-Nankana District of Northern Ghana. *Scandinavian Journal of Public Health.* **38**: 95-103.

Serwaa-Bonsu, A. et al. (**in press**). First experiences in the implementation of biometric technology to link data from health and demographic surveillance systems with health facility data. *Global Health Action*.

A3.4 INDEPTH Network - Working Groups, December 2009

INDEPTH supports working groups dedicated to issues of key interest to the Network to act as generators and incubators for multi-site research.

Adult Health and Aging
Leader: Stephen Tollman, Agincourt Health and Demographic Surveillance site, South Africa
Funding: INDEPTH core resources, NIA, WHO and Umea University.

HIV/AIDS – Anti-Retroviral Therapy Rollout
Leader: Marie-Louise Newell, Africa Centre HDSS, South Africa
Funding: Rockefeller funded proposal development. Now looking for funding to implement project.

Non-Communicable Disease monitoring in Asia/Oceania
Leader: Sanjay Juvekar and Nawi Ng, Vadu (India) and Purwerojo (Indonesia) HDSS sites
Funding: Initial volume published based on work funded by INDEPTH using core funds. A new proposal has been submitted to the European Union for funding to undertake further research.

Migration and Urbanisation
Leaders: Mark Collinson and Kubaje Adazu (late), Agincourt (South Africa) and Kisumu (Kenya) HDSS sites respectively.
Funding: Initial volume published. INDEPTH will try to provide some resources to support one meeting for development of a new proposal. Once a proposal is developed the secretariat will help market the proposal to funders to seek funding.

Vaccination and Child Survival
Leader: Peter Aaby, Bandim HDSS, Guinea Bissau, and INDEPTH Board Member
Funding: Group was initially supported by secretariat. A proposal has been developed and group now seeking funding

Health Equity
Leader: Abbas Bhuiya, Chakaria HDSS, Bangladesh.
Funding: Phase I was supported by INDEPTH secretariat. Phase II will initially be nurtured to develop a proposal which will now be marked for funding.

A3.5 INDEPTH Network - Interest Groups, December 2009

These comprise groups proposing cross-site activities. While many of these groups do not take off from the concept phase, the secretariat provides seed money to enable groups with a high potential to raise funds so they can convene proposal development workshops.

Cost of Illness
Leader: Chuc Nguyenthikim, Filabavi HDSS, Vietnam and Jane Gouge, Agincourt HDSS, South Africa
Funding: INDEPTH supported proposal development. Funding now being sought for implementation of project.

Antibiotic Resistance
Leader: Andreas Heddini, Board Member, INDEPTH Network and Executive Director, ReAct, Sweden.
Funding: INDEPTH will jointly fund a workshop in April with ReAct for proposal development. The group will then have to raise its own funding.

Tuberculosis
Leader: Kayla Laserson, Kisumu HDSS, Kenya.
Funding: INDEPTH to provide funding for one workshop. Subsequently the group will have to raise its own funding.

A3.6 INDEPTH Network - Annual General and Scientific Meetings (AGMs)

Meeting	Start Date	End Date	Venue	Number of Participants
First INDEPTH AGM	26/06/2000	30/06/2000	Johannesburg, South Africa	56
Second INDEPTH AGM	21/01/2002	25/01/2002	Addis-Ababa, Ethiopia	100
Third INDEPTH AGM	03/02/2003	07/02/2003	Accra, Ghana	112
Fourth INDEPTH AGM	03/05/2004	07/05/2004	Hanoi, Vietnam	118
Fifth INDEPTH AGM	23/05/2005	27/05/2005	Durban, South Africa	150
Sixth INDEPTH AGM	18/09/2006	23/09/2006	Ouagadougou, Burkina Faso	137
Seventh INDEPTH AGM	03/09/2007	07/09/2007	Nairobi, Kenya	193
Eighth INDEPTH AGM	22/09/2008	27/09/2008	Dar-es Salaam, Tanzania	250
Ninth INDEPTH AGM	25/10/2008	29/10/2009	Pune, India	195

A3.7 INDEPTH Network – Scientific Workshops, 2008-2009

Meeting	Start Date	End Date	Venue	No. of Sites / Participants
Cost of Illness	02/06/2008	04/06/2008	Moundaso, Burkina Faso	12 / 13
Monitoring & Assessment of Educational Outcomes	07/07/2008	11/07/2008	Ougadougou, Burkina Faso	13 / 14
Using GIS in Health and Demographic Surveillance	12/08/2008	14/08/2008	Bangkok, Thailand	10 / 10
Analysis of INDEPTH Longitudinal Data	21/08/2008	28/08/2008	Accra, Ghana	10 / 15
Indoor Air Pollution and Chronic Respiratory Non-Communicable Diseases	12/01/2009	14/01/2009	Pune, India	13/15
Cause of Death Determination	19/01/2009	21/01/2009	12th to 14th January, 2009	13 / 14
Anti-Retroviral Therapy Rollout Workshop	01/06/2009	01/06/2009	Accra, Ghana	5 / 6
Clustering of Mortality at INDEPTH Sites	01/06/2009	03/06/2009	Accra, Ghana	15 / 20
Sexual and Reproductive Health	14/12/2009	16/12/2009	Accra, Ghana	11 / 15

A3.8 INDEPTH Network – Capacity Strengthening Workshops, 2008-2009

Meeting	Start Date	End Date	Venue	No. of Sites / Participants
Technical Meeting for Data Managers	18/05/2008	23/05/2008	Accra, Ghana	17 / 18
Communication Skills	12/08/2008	12/08/2008	Ho, Ghana	16 /19
Site Administrators Meeting	22/07/2008	26/07/2008	Rakai, Uganda	13 / 16
Financial Management for INDEPTH Sites	18/08/2008	20/08/2008	Agincourt, South Africa	7 / 7
Communications for Health Researchers	16/02/2009	19/02/2009	Bangkok, Thailand	12 / 18
Biometrics for Individual Identification	02/03/2009	05/03/2009	Somkele, South Africa	11 / 17
Strategic Planning and Leadership	23/03/2009	27/03/2009	Bangkok, Thailand	8 / 15
Data Documentation using the DDI V3.0 Standard	30/03/2009	02/04/2009	Nairobi, Kenya	13 / 16
Scientific Writing	18/05/2009	20/05/2009	Ho, Ghana	8 / 12

A3.9 INDEPTH-sponsored students, Masters in Population-based Field Epidemiology, University of the Witwatersrand, South Africa

Year	Student	Field Attachment	Gender	Country of Origin	Status
2005/6	Adjei George	Africa Centre	M	Ghana	Graduated 2007
	Chalwe Victor	Navrongo	M	Zambia	Graduated 2006
	Kiriinya Rose	Ifakara	F	Kenya	Graduated 2007
	Muindi Kanyiva	Navrongo	F	Kenya	Graduated 2006
	Welaga Paul	Africa Centre	M	Ghana	Graduated 2006
	Azongo Daniel	Africa Centre	M	Ghana	Research report 10/2008; graduation 6/2009
2006/7	Duong Le Queen	Navrongo	F	Vietnam	Graduated 2007
	Joseph Maurice	Navrongo	M	Kenya	Graduated 2007
	Lele Pallavi	Navrongo	F	India	Revised report 1/2009; graduation 6/2009
	Ndirangu James	Africa Centre	M	Kenya	Graduated 2008
	Tindanbil Daniel	Ifakara	M	Ghana	Graduated 2008
2007/8	Bangre Oscar	Africa Centre	M	Ghana	Research report 2/2009; graduation 6/2009
	Ajaari Justice	Ifakara	M	Ghana	Graduated 2008
	Nattey Cornelius	Ifakara	M	Ghana	Graduated 2008
	Ogola Dan	Navrongo	M	Kenya	Completed course
2008/9	Daniel Nyogea	Navrongo	M	Ghana	Due to graduate
	Seri Maraga	Navrongo	F	Papua New Guinea	Due to graduate
	Mansour M Ndiath	Navrongo	M	Senegal	Due to graduate
	Sammy Khagayi	Navrongo	M	Uganda	Due to graduate
	Matthew Sangber-Dery	Ifakara	M	Ghana	Due to graduate
	Illah Evance Ouma	Ifakara	M	Kenya	Due to graduate
	Kenneth Ae-Ngibise	Ifakara	M	Kenya	Due to graduate
	Daniel Kadobera	Ifakara	M	Kenya	Due to graduate
	Francis Yeji	Africa Centre	M	Ghana	Due to graduate
	Andrew Anguko	Africa Centre	M	Kenya	Due to graduate
	Charfudin Sacoor	Africa Centre	M	Mozambique	Due to graduate
	Christian Nikoi	Africa Centre	M	Ghana	Due to graduate
2009/10	Amon Exavery	Navrongo	M	Tanzania	Field Attachment
	Frederick Murunga	Ifakara	M	Kenya	Field Attachment
	Solomon Narh-Bana	Ifakara	M	Ghana	Field Attachment
2010/11	Dorean Nabulalu	Not yet decided	F	Uganda	Course Work

A3.10 INDEPTH Fellows, 2008-2009

Name	Site	Post	Qualification	Period
S S Sambhudas	Vadu	IT Officer	BA Economics	1 Nov 2008 - 31 Oct 2009
I Traore	Nouna	Geographer	MSc (Medical Geography)	1 Oct 2008 - 31 Dec 2008
R A Ochako	Nairobi	Researcher	MA Demography	1 Sept 2008 - 31 Aug 2009
D Ottie-Boakye	Dodowa	Researcher	MPhil Population Studies	1 Sept 2008 - 31 Aug 2009
C Kanjala	Dikgale	Researcher	MPhil Demography	1 Jan 2009 - 31 Dec 2010
R Singh	Ballabgarh	Data Manager	MCA, Computer Science	1 Dec 2008 - 30 Nov 2009
O E Nettey	Kintampo	Demographer	MPhil Population Studies	1 Feb 2009 - 31 Jan 2010
J Rittirong	Kanchanaburi	GIS Data Analyst	MSc Info Systems Management	1 Jan 2009 - 31 Dec 2009
K Nantanitikron	Kanchanaburi	Data Manager	MSc Info Systems Management	1 Jan 2009 - 31 Dec 2009
P R Dwivedi	Ballabgarh	Demographer / Statistician	MSc Population Studies	1 Jan 2009 - 31 Dec 2009
A Acharya	Vadu	Demographer	MPS Business Demography	16 Mar - 16 Feb 2010
AYawilat	Kanchanaburi	Research Assistant	MA Social Development	1 May - 31 Oct 2009
D Ottie-Boakye	Dodowa	Research Assistant	MPhil Population Studies	1 Sept - 30 Aug 2010