

INDEPTH Network



Delivering
Better Health Information
Driving
Better Health Policy

THE PAST, THE PRESENT & THE FUTURE



SENEGAL

Bandafassi HDSS
Mlomp HDSS
Niakhar HDSS

THE GAMBIA

Farafenni HDSS
West Kiang HDSS

GUINEA BISSAU

Bandim HDSS

BURKINA FASO

Kaya HDSS
Nanoro HDSS
Nouna HDSS
Ouagadougou HDSS
Sapone HDSS

NIGERIA

Nahuche HDSS

COTE D'IVOIRE

Taabo HDSS

GHANA

Dodowa HDSS
Kintampo HDSS
Navrongo HDSS

SOUTH AFRICA

Africa Centre HDSS
Agincourt HDSS
Dikgale HDSS

ETHIOPIA

Butajira HDSS
Dabat HDSS
Gilgel Gibe HDSS
Kersa HDSS
Kilite Awlaelo HDSS

UGANDA

Iganga/Mayuge HDSS
Rakai HDSS

KENYA

Kilifi HDSS
Kisumu HDSS
Kombewa HDSS
Mbita HDSS
Nairobi HDSS

TANZANIA

Ifakara HDSS
Magu HDSS
Rufiji HDSS

MALAWI

Karonga HDSS

MOZAMBIQUE

Manhica HDSS

INDIA

Ballabgarh HDSS
Birbhum HDSS
Vadu HDSS

BANGLADESH

Bandarban HDSS
Chakaria HDSS
Matlab HDSS

THAILAND

Kanchanaburi HDSS

VIETNAM

Chililab HDSS
Dodalab HDSS
Filabavi HDSS

INDONESIA

Purworejo HDSS

PAPUA NEW GUINEA

PiH HDSS
Wosera HDSS



INDEPTH Network

**DELIVERING
BETTER HEALTH INFORMATION
DRIVING
BETTER HEALTH POLICY**

THE PAST, THE PRESENT
& THE FUTURE

FOREWORD

This brochure presents INDEPTH — a vibrant global organisation of currently 42 member health research centres in 20 countries in Africa, Asia and Oceania — its achievements and its goals for the future. What has brought us so far is our unfaltering optimism that hard work, focus and innovation result in consistent progress.

We have always sought and used every opportunity to work closely with the Board of Trustees who in turn clearly demonstrated its leadership role.

We intensified our utilisation of the Scientific Advisory Committee to steer the Network's scientific agenda into promising directions.

We reinvigorated INDEPTH's Working Groups to realise their ambitious plans for expanding the boundaries of scientific knowledge.

We encouraged our member centres and supported their incredibly important research projects. By generating high quality and uniquely important longitudinal health and demographic data, they are making major contributions towards guiding health priorities and policies in low- and middle-income countries.

We remained accountable to our funders/development partners. Through the impact we make, our funders can also share in the satisfaction of knowing that they demonstrably help people live healthier lives.

In partnership with our collaborators, we energetically strive to translate the successful research into improved global policies. To this end, we are synthesising the knowledge generated by INDEPTH into comprehensive policy documents to influence policy-making and ensuring an on-going dialogue among policy makers, practitioners and scientists.

We are confident that our cumulative scientific contributions will continue to be an integral part of worldwide breakthroughs. The work of the entire INDEPTH network will be seen as a key component of the history of health research from the global South.

Prof. Osman Sankoh

Executive Director



INDEPTH IN BRIEF

INDEPTH is a global leader in health and population research, providing robust answers to some of the most important questions in development. The lack of a reliable information base to support the identification, prevention and treatment of health problems is a major hurdle to addressing the high burden of disease in low- and middle-income countries. INDEPTH—through its global network of 49 health and demographic surveillance system (HDSS) sites run by 42 research centres in 20 countries across Africa, Asia and the Pacific region — is the only organisation in the world capable of developing that information base. It tracks a total population of over 3.5 million people, providing high quality longitudinal data not only about the lives of people in low- and middle-income countries (LMICs), but also about the impact on those lives of development policies and programmes.

Dated as at March 2014



EXECUTIVE SUMMARY

The Network

Across Africa, Asia and the Pacific region, a growing number of community-based research centres are using robust longitudinal data from health and demographic surveillance systems (HDSS) to address the critical gaps in information on population health in low- and middle-income countries (LMICs).

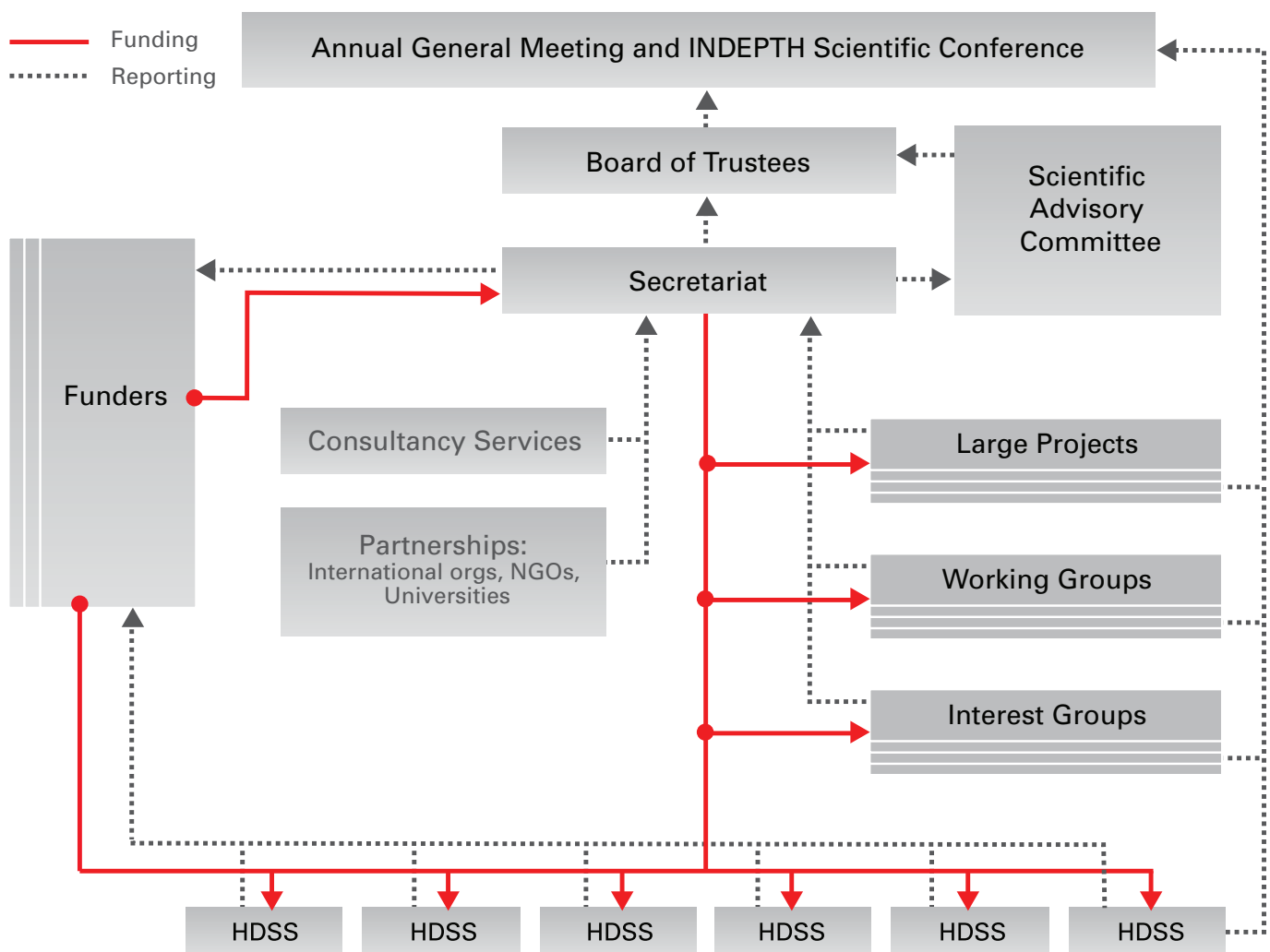
The data — collected through regular visits to every household in a geographically-defined area, answer key questions about the nature of health and demographic transitions and their implications for health, health systems and wellbeing at all ages. It also measures the impact of policies and programmes on mortality, morbidity, fertility, poverty and

other key intervention targets. Many health interventions that are now used routinely across the world were trialled on HDSS research platforms.

■ INDEPTH's member HDSS sites track 3.5 million lives — the longitudinal data enables scientists to identify true causes and measure effects in demography and health across the LMICs.

INDEPTH is at the heart of this network of HDSS centres, which is recognised for the data it generates, its multi-site collaborations and its potential as a cross-site trials platform. Our vision is to harness the world's HDSSs and bring empirical understanding to bear on critical persisting and emerging health problems. It is the only sustainable source of longitudinal data that can provide the knowledge and policy-relevant evidence needed to serve health and development in the Global South.

The Network provides HDSS centres with the capacity to undertake cross-site scientific research and to pool findings, including by developing standardised tools and



The INDEPTH network is organized to build on the work of Independent Research Centres managing 49 HDSS sites. It is structured to help facilitate cross site studies through a set of Working Groups and Interest Groups.

methodologies for health and population research. The Network also helps to improve the technical strength and scientific value of site-specific studies, by providing support for scientists working in HDSS centres to share methodologies, exchange ideas on best international practices in health, and learn new analytical skills and methodological innovations.



Key Achievements

Since its inception, INDEPTH and its growing network (42 member centres as at March 2014, tracking over 3.5 million lives) have strengthened demographic and health science in low- and middle-income countries by improving data collection tools, uniting research efforts and sharing results. The work has resulted in multiple monographs on population, health and cause of death as well as studies that have influenced policy and improved outcomes in LMICs, including:

- **Identifying risk factors for epilepsy:** INDEPTH member centres in five countries collaborated on the largest study to date of epilepsy in Africa. The study of more than half a million people was the first to reveal the true extent of the problem, showing that adults who had suffered parasitic diseases were 1.5 to 3 times more likely to have epilepsy, and that complications during delivery were a major risk factor for children.
- **Enabling trials for Malaria Vaccines & Therapies:** The Malaria Clinical Trials Alliance (MCTA) under INDEPTH leadership has provided training and improved infrastructure to ensure the successful execution of clinical malaria vaccine and therapeutic trials in ten countries across Africa. The project has increased the number of centres in Africa with the up-to-date capacity for clinical trials.
- **Assessing the Effectiveness of Anti-Malarials:** The INDEPTH Effectiveness and Safety Studies of Antimalarials in Africa (INESS) has brought together seven HDSS centres to conduct effectiveness studies of anti-malarial drugs in Africa. It is the first time this kind of Phase IV study for anti-malarials has taken place in Africa under the leadership of African researchers.
- **Evaluating Child Health Interventions:** The OPTIMUNISE multi-centre study (Optimising the impact and cost-effectiveness of child health intervention programmes of vaccines and micronutrients in low-income countries) uses HDSS sites in Asia and Africa as a platform to assess the effect of major child health interventions including vaccines, micronutrient supplementation and de-worming programmes. In 2011 and 2012, INDEPTH member centres published 23 papers on their effectiveness. Plans are underway to extend these efforts to other HDSSs.



Each member HDSS site organizes a regular full demographic census of all residents in its community — using detailed interview guides ... Here an interviewer uses a specially designed hand held device to record up-to-date information from a respondent.

- **Understanding the Impact of Aging in the LMICs:** As part of the WHO's SAGE (the WHO Global Survey on Adult Health and Global Aging) eight INDEPTH sites in Asia and Africa conducted field-tests and now help drive the programme. It aims to strengthen empirical understanding of aging across countries and to assess follow-up strategies.
- **Developing an Oral Cholera Vaccine:** The Matlab HDSS rural intervention for vaccine trials yielded important findings on the effectiveness of injectable and oral cholera vaccines and diarrhoea disease control. The oral cholera vaccine tested by the Centre is now recommended by the World Health Organisation.
- **Improving Family Planning:** Family planning strategies first tested at Matlab and rolled out throughout Bangladesh led to the country's recognition as a family planning success story at the 1994 United Nations Conference on Population and Development in Cairo.
- **Ensuring the Adoption of Vitamin A:** The Navrongo Health Research Centre in northern Ghana found that providing Vitamin A supplements to children below the age of five reduced the number of child deaths by one fifth, and led to the program's adoption throughout Ghana.



- **Identifying the Importance of Treated Bed Nets:** Studies in Navrongo found that bed nets soaked in permethrine cut child deaths by 17 per cent, which led to bed net provision being incorporated into health policies across Africa.
- **Demonstrating the Effectiveness of Hib Vaccine:** A study by the Kilifi HDSS in Kenya found that the *Haemophilus influenzae* type b (Hib) vaccine was highly effective — and cost-effective — in reducing incidence of meningitis, pneumonia and sepsis in children, resulting in the Kenyan government reversing its decision to withdraw the vaccine.
- **Proving the Value of Retroviral Therapies for HIV:** The Africa Centre for Health and Population Studies, based at Mtubatuba in KwaZulu-Natal South Africa, has shown for the first time in real life (as opposed to just lab-based models) that when 30% or more of all HIV-infected adults in a community are on HIV treatment incidence rates significantly decrease. A second paper in *Science* showed the impact of antiretroviral therapy on increasing life expectancy.
- **Launching Programs to Reduce Anaemia:** A study of iron deficiency anaemia by the Vadu HDSS in India led to the implementation by Indian states of programs to distribute micronutrient Sprinkles. The Vadu site has also conducted vaccine trials for rotavirus, typhoid and aerosol measles vaccines.

Research Strategy and Capacity Strengthening

INDEPTH conducts research studies and strengthens global capacity to conduct studies that use the key demographic outcomes measured by HDSS centres: fertility and/or pregnancy outcomes, all-cause and cause-specific mortality, and mobility. Priority is given to outcomes that are best assessed with both longitudinal and complete census data collection systems and that require research across geographies (more than one HDSS). These tools allow one to identify both cause and effect as researchers can study what

happens to individuals over time, and see the impact of different changes across the population. Advantaged research areas include not just neonatal, maternal and adult mortality — which clearly require longitudinal tracking — but also such emerging fields as migration, urbanization and climate change.

INDEPTH brings together teams of scientists from different centres to form “Working Groups” focused on specific research areas. The groups are central to INDEPTH’s work, acting as generators and incubators for multi-site research and developmental projects. Current Working Groups cover vaccination; non-communicable diseases; adult health and aging; sexual and reproductive health; maternal and newborn health, mental health and epilepsy; migration; urbanization and health; environment and health, genetics/genomics; cause of death determination; and data analysis and data systems management. As well as being published in scientific journals, the outputs from the Working Groups are presented and discussed at INDEPTH’s biennial International Scientific Conference, a major global gathering of demographers, epidemiologists, public health specialists, social scientists, and other scientific researchers from Africa, Asia and Oceania.

Strengthening the capacity of the member HDSSs is at the heart of INDEPTH’s role. We help individual centres to publicise their research results for greater policy influence, and to improve their management, administrative, financial and IT operations and strengthen leadership skills of personnel. At a multi-centre level, our workshops train data managers and analysts, strengthen data sharing among members and with the broader scientific community and the public, and help develop the next generation of HDSS professionals through our Scientific Development and Leadership Programme and the INDEPTH Fellowship Programme.

■ INDEPTH’s five-country study showed that delivery complications are a major risk factor for epilepsy, demonstrating the importance and value of perinatal care.



The Future

INDEPTH's strategy for 2013-2016 will focus on the three core activities of the INDEPTH Network.

Research: INDEPTH continues to focus on creating metadata, increasing the cross-site comparability of the analytic variables, and supporting data sharing. It launched the digital iSHARE2 initiative, in which member centres are supported to display their data freely on the web. iShare2 is a unique longitudinal data repository of HDSS data. We already have established minimum data set criteria for full membership — mandating a maximum 2% error rate — and the Secretariat has established an experienced data quality inspection team, along with a resource centre for data assurance on its website.

■ “INDEPTH's longitudinal data design is uniquely structured to answer questions about impact, which is what every donor seeks.”

— External Evaluator

Capacity Strengthening: INDEPTH continues to help develop the talent of promising and productive scientists within INDEPTH member institutions, and enhance members' capacity to collect quality data and conduct world-class research. This will include training to enhance the skills of field scientists in research data management, measurement disciplines, longitudinal data analysis and study design, and strengthening cross-site data management by applying best practice methods of harmonising, storing, curating and sharing epidemiological and demographic data. An important avenue both for furthering these efforts and for our additional goal of promoting young academics is the introduction of a new MSc programme in research database

management. This will be delivered in partnership with the University of the Witwatersrand in Johannesburg, South Africa.

Policy Engagement: INDEPTH will take steps to reduce the critical gap between research findings and action. It seeks to ensure a dialogue across



Site leaders meet regularly with supervisors and field interviewers to ensure high quality data collection.

member centres and with local, national, regional and global health policy makers — both about the results of INDEPTH studies that can improve policies — as well to identify the core questions that policy makers have — and that only INDEPTH's unique data and research can address. It will continue to tailor, package and direct research outputs for different audiences and stakeholders. INDEPTH has raised the profile of Health and Demographic Surveillance System centres as a source of health and development research and information, but more can be done to facilitate translation of findings into policy and practice. We will also facilitate much wider access to and use of the longitudinal population-based data generated from HDSS studies.

■ The HDSS in Navrongo, Ghana found that Vitamin A supplements reduced the number of child deaths by one-fifth, and led to the programme's adoption throughout the country.



THE WORK WE'VE DONE

A HERITAGE OF IDENTIFYING AND ALLEVIATING HEALTH CHALLENGES

The Ongoing Need for a Health Information Network

In the world's poorest countries, where the burden of disease remains highest, there remains a void in vital health information. This constitutes a major and long-standing constraint to setting effective health policies and programmes. The need for a reliable information base — both to identify and measure health challenges and develop and assess ways to improve health — in low- and middle-income countries is as great as ever.

■ The oral Cholera vaccine tested by the Matlab site in Bangladesh is now recommended by the WHO.

An increasing number of community-based research centres, founded on Health and Demographic Surveillance Systems (HDSSs), monitors geographically defined populations over long periods of time and continues to make a critical contribution to addressing this deficit. The centres have adopted a highly focused intervention-oriented research agenda that targets a range of health, social, economic and behavioural studies and evaluations. The high quality data they generate has both a strong track

record and great potential to inform priority setting, policy decisions and the allocation of resources. Many health interventions that are now used routinely across the world (from vitamin A supplementation and measles, tetanus and pertussis vaccination to insecticide-treated bed nets to prevent malaria transmission) were first trialled on HDSS research platforms.



Each site provides regular feedback to the community to ensure continued cooperation from residents — and enable valuable longitudinal data.

The Origins of INDEPTH

HDSS centres collect health and demographic surveillance data through regular visits to all households in a geographically-defined area. They record longitudinal information that links health outcomes and their determinants at individual, household and community levels. These data answer key questions about the nature of health and demographic transitions in low- and middle-income countries, where vital registration systems are usually weak or incomplete. They also enable scientists to address the implications of these transitions for health, health systems and wellbeing at all ages, and the impact of policies and programmes on mortality, morbidity, fertility, poverty and other key intervention targets.

INDEPTH is at the heart of this network of centres. Prior to the formation of the INDEPTH Network, health and demographic surveillance system centres operated as disparate research entities in small localities within countries. Although these centres conducted important research, many of their findings remained unknown in the international health arena. The INDEPTH Network was created in recognition of the importance of having a critical mass of HDSS centres with the ability to conduct research of international importance using comparative and standardised tools.

In 1997 systematic attempts were undertaken to connect HDSS centres and make their research outputs more widely available. A series of consultative meetings were convened by the University of the Witwatersrand, South Africa and its MRC/Wits Unit in Rural Public Health and Health Transitions Research (the Agincourt Unit) together with the London School of Hygiene and Tropical Medicine, Heidelberg University (Department of Tropical

■ The Kilifi HDSS in Kenya showed that the Hib vaccine was highly effective in reducing the incidence of meningitis, pneumonia and sepsis in children. As a result, Kenya reversed its decision to withdraw the vaccine.

Hygiene and Public Health) in Germany, the Rockefeller Foundation which worked with the Wellcome Trust, and the Ghana Ministry of Health in Navrongo, Ghana, to examine the potential of connecting these centres through a well-focused network. In 1998, these consultations culminated in the formal constitution of the INDEPTH Network — International Network for the Demographic Evaluation of Populations and Their Health — in Dar es Salaam, Tanzania. The first Annual General and Scientific Meeting was hosted by Agincourt HDSS in South Africa

in 2000. At its second Annual General and Scientific Meeting held in Addis Ababa, Ethiopia in January 2002 hosted by Butajira HDSS, INDEPTH, a not-for-profit international non-governmental organisation with dedicated resources, adopted a strategic plan that transformed it into an independent corporate body with a formal governance structure.

A decade of INDEPTH development has seen steadily rising output reflected in the publication of books, articles and journal collections. These address gaps ranging from unrecorded trends in mortality and cause of death to life-course research emphasising children, adults and older persons to fine-grained descriptions of migration and its health consequences. Standardised survey instruments have been developed and materials provided to new sites during set-up, and multi-site analyses increasingly use harmonised variables and integrated datasets.

INDEPTH today is a research and training network recognised for the data it generates, its multi-site collaborations and its potential as a cross-site trials platform. Since its inception, INDEPTH and its growing network of members have carried out a number of landmark studies that have had major impacts on policy across the LMICs. Highlights include the following:

- **Highlighting the Relationship between Neonatal Care, Parasitic Diseases and Epilepsy:** INDEPTH member centres in Ghana, Tanzania,

Kenya, Uganda and South Africa collaborated on the largest study to date of epilepsy in Africa. The study of more than half a million people was the first to reveal the true extent of the problem, showing that adults who had suffered parasitic diseases were 1.5 to 3 times more likely than other adults to have epilepsy, and that complications during delivery were a major risk factor for children. The study authors highlighted the importance of parasitic disease control and improved antenatal and perinatal care in reducing epilepsy. The findings were published in the *Lancet Neurology* journal in January 2013.

- **Building a Real Life Platform to Assess Ways to Address Malaria:** The Malaria Clinical Trials Alliance (MCTA) under INDEPTH leadership is working with two other Gates Foundation grantees, the Malaria Vaccine Initiative and the Medicines for Malaria Venture, to train personnel and improve facilities and infrastructure to ensure the successful execution of clinical malaria vaccine and therapeutic trials in ten countries across Africa. The 18 million dollar project aims to ensure that trial sites become self-sustainable through being equipped with effective management who have the tools to identify, hire and train staff, database and communications systems, and transparent financial systems. This will increase the number of centres in Africa that have the capacity to conduct clinical trials in malaria and other fields.

- **Testing Malaria Therapies:** The INDEPTH Effectiveness and Safety Studies of Antimalarials in Africa (INESS) has brought together seven HDSS sites to conduct effectiveness studies of anti-malarial drugs in Africa. This is the first time that this kind of Phase IV study for anti-malarials has taken place in Africa under the direction of African researchers. The project provides objective country-specific effectiveness and safety data to inform global and national policy and practice.

■ HDSS studies showed the use of treated bed nets can reduce child mortality from Malaria by almost 20%.

■ The Africa Centre in KwaZulu Natal provided the first real life demonstration that Retroviral therapy can reduce the incidence of new HIV infections.

■ **Improving Child Health Interventions:**

Another multi-centre study — Optimising the impact and cost-effectiveness of child health intervention programmes of vaccines and micronutrients in low-income countries (OPTIMUNISE) — uses HDSS sites in Africa and Asia as a platform to assess the effect of child health interventions including vaccines, micronutrient supplementation and

de-worming programmes. Observational studies and randomised controlled trials are testing the effect of existing and new interventions on child survival and measuring the overall impact of programmes designed to improve child health in low-income settings. In 2011 and 2012, INDEPTH member centres produced 23 published papers on the effectiveness of vaccines and other childhood health interventions.

- **Monitoring the Growing Impact of Non-Communicable Diseases:** In 2009-2010 INDEPTH used supplements in open-access journals to publish three sets of multi-site papers. The first related to cross-site findings on noncommunicable disease risk factors from a group of INDEPTH member HDSS sites in Asia, the second to mortality clustering across a range of INDEPTH member HDSS sites, and the third to results from eight INDEPTH member HDSS sites, which participated in the WHO-SAGE programme on ageing (see below). The latter supplement represented an innovation for the INDEPTH Network, with the combined dataset used for the analyses also being published online together with the papers.

- **Pioneering Field Research for the WHO:** Work on Adult Health and Aging is well advanced at the eight INDEPTH sites that have field-tested the WHO Global Survey on Adult Health and Global Aging (SAGE). This work followed an initial investigation by INDEPTH's Adult Health Working Group of comparative mortality and cardiovascular risk among adults at INDEPTH sites. The programme aims to strengthen empirical understanding of aging and older persons within and across countries and to assess follow-up strategies or test new survey methods. INDEPTH's work on adult health and aging has been recognised and referenced



Because of the longitudinal nature of the data — and the regular meetings with every member of a community, INDEPTH member HDSS field sites provide an ideal place to do real-life testing of potential health and health policy interventions.

in a high profile general publication '*Why Population Aging Matters: A Global Perspective*' produced by the NIH and US Department of State.

- **Saving Lives through Vitamin A and Bednets:** The Navrongo Health Research Centre in northern Ghana has rapidly gained recognition as a world leader in LMIC health research. Its first study, which found that providing Vitamin A supplements to children below the age of five reduced the number of child deaths by one fifth, led to the program's adoption throughout Ghana. Its second study found that bed nets soaked in permethrine cut child deaths by 17 per cent, and led to bed net provision being incorporated into health policies across Africa. A later study, found that the MenA conjugate vaccine for meningitis is protective and safe for infants.
- **Demonstrating the Value of New Malaria Therapies:** Drug trials at the Manhica Demographic Surveillance System site in Mozambique helped the national government to replace chloroquine with amodiaquine and sulphadoxine-pyrimethamine as its principal malaria treatment. The Manhica site has helped develop a nationwide malaria risk map for the National Malaria Control Programme.



- **Proving the Importance of the Hib Vaccine:** A study by the Kilifi Health and Demographic Surveillance System in Kenya found that the *Haemophilus influenzae* type b (Hib) vaccine was highly effective — and cost-effective — in reducing incidence of meningitis, pneumonia and sepsis in children. This finding persuaded the government of Kenya to reverse its decision to withdraw the vaccine.
- **Ensuring the Adoption of the Oral Cholera Vaccine:** The Matlab, Bangladesh HDSS's conducted rural intervention for vaccine trials and yielded important findings on the effectiveness of injectable and oral cholera vaccines. The oral cholera vaccine tested by the Centre is now recommended by the World Health Organisation. Family planning strategies tested at Matlab, meanwhile, have been adopted nationwide and led to Bangladesh's recognition at the landmark 1994 United Nations Conference on Population and Development in Cairo as a family planning success story.
- **Slowing the Transmission of HIV:** The Africa Centre for Health and Population Studies, based at Mtubatuba in South Africa, has conducted pioneering studies in the field of HIV/AIDS research. In February 2013 it published findings showing for the first time in real life (as opposed to in models) that when 30% or more of all HIV-infected adults in a community are on HIV treatment the incidence in that community substantially and significantly decreases. A second paper published in *Science* showed that antiretroviral therapy increased life expectancy.
- **Initiating the Use of Micronutrients:** A study of iron deficiency anaemia by the Demographic Surveillance System at Vadu in India led to the implementation by Indian states of programs to distribute micronutrient Sprinkles. The Vadu site has also conducted vaccine trials for rotavirus, typhoid and aerosol measles vaccines.

THE WORK TODAY

MEASURING THE IMPACT OF THE BURDEN OF DISEASE AND CHANGING DEMOGRAPHY


INDEPTH's Scientific Vision

The overall aim of INDEPTH's research is to generate robust scientific knowledge that can guide evidence-based health and social policy interventions at local, national and international levels.

Our vision is to harness the world's HDSSs and bring empirical understanding to bear on critical persisting and emerging health problems. There are no other sustainable sources of longitudinal data that can provide the knowledge and policy-relevant evidence needed to serve health and development in the Global South. The scale of INDEPTH data (community-level data on geographically-defined populations ranging from 10,000 to 225,000 people are collected at least annually, providing empirical longitudinal information on over 3.5 million people worldwide) make robust findings and causal inference possible.

■ INDEPTH
improves the
effectiveness and
efficiency of research
investments.

The Network provides HDSS centres with the capacity to undertake cross-site scientific research and to pool findings, through training and the development of standardized tools and methodologies for health and population research. Pooled data from multiple centres increases the credibility of research findings and allows for their widespread application. The Network also helps to improve the technical strength and scientific value of site studies, by providing support for scientists working in HDSS centres to share methodologies, exchange ideas on best international practices in



health, and learn new analytical skills and methodological innovations. The Network thereby improves the effectiveness and efficiency of research investments, and has great potential to impact global and national health policy and practice.

Research Strategy

In order to make this vision a reality, INDEPTH conducts research studies and strengthens global capacity to conduct studies that use the key demographic outcomes measured by HDSS centres: fertility and/or pregnancy outcomes, all-cause and cause-specific mortality, and mobility. Priority is given to outcomes that are measured poorly by other data collection systems, including neonatal, maternal and adult mortality, and to answering questions that require research in more than one HDSS. Our eight key research priorities are to:

1. Describe and monitor changing patterns of all-cause and cause-specific mortality by age and sex in different low- and middle-income countries.
2. Conduct intervention research in which effectiveness is measured in terms of impact on health and demographic outcomes at the population level.
3. Conduct comparative and longitudinal analyses of the determinants of health and demographic outcomes at the level of the individual, household, community, and social and health systems.
4. Investigate the implications for welfare and health systems of epidemiological and demographic transitions, including changes in disease profiles, population growth rates and population ageing.
5. Quantify and better understand the relationships between poverty, inequity and health, including the contributions made to health inequalities by material deprivation, lack of education, and inability to access welfare benefits and preventative and curative health services.
6. Track the progress made by intensified national and international

■ INDEPTH is assessing the extent to which family size and new births cause families to fall into poverty — to provide guidance to family planning efforts.

programmes (such as free maternal health services or antiretroviral therapy roll-out) toward improving key health indicators (for example, maternal mortality and under-5 mortality).

7. Investigate longitudinally the relationship between different demographic variables such as the death of a household member and subsequent migration of other household members, including the long-term consequences of early life events and inter-generational effects on health.
8. Conduct research that needs longitudinal data to validate survey instruments or to develop methods for detecting and correcting reporting biases for subsequent use in cross-sectional studies.

Working Groups are central to INDEPTH's research. These act as generators and incubators for multi-site research and developmental projects. Current Working Groups cover but not limited to the following thematic areas:

- Vaccination and child survival
- Non-communicable diseases
- Adult health and aging
- Sexual and reproductive health (with special focus on adolescents)
- Maternal and newborn health
- Mental health and neurology including epilepsy
- Migration, urbanization and health
- Environment and health (with particular attention to climate change, migration and mortality)
- Genetics/genomics
- Cause of death determination

- Health systems research with particular attention to universal health coverage (UHC)
- All-cause and cause-specific mortality analysis
- Malaria attributable mortality
- Data analysis and data systems management
- Social science research

As well as being published in scientific journals, the outputs from the Working Groups are presented and discussed at INDEPTH's biennial International Scientific Conference. The conference is a major global gathering of demographers, epidemiologists, public health specialists, social scientists, and other scientific researchers from Africa, Asia and Oceania and INDEPTH partners/collaborators from across the globe. It brings together scientists and scholars from demographic surveillance sites with international participants from the scientific and donor communities, providing researchers with an opportunity to share their experiences in demographic surveillance and present and discuss their work with a wide global audience.



Many HDSS sites collect biomedical data to support specific research projects.

Capacity Strengthening Initiatives

Strengthening the capacity of the HDSS network members is at the heart of INDEPTH's role, and is vital for improving the quantity and quality of data that member centres produce. We help individual centres to publicise their research results for greater policy influence, and to improve their management, administrative, financial and IT operations and strengthen leadership skills of personnel. At a multi-centre level, we support centers through the development and co-ordination of multi-centre comparative research work, enhancing technical and methodological development; facilitating exchanges between centre leaders, scientists, operational staff and data managers as well as the generation and publication of comparable data on population health patterns. We also provide support to research and technical working groups through workshops. Indeed, our workshops train data managers and analysts and help develop the next generation of HDSS professionals through our Scientific Development and Leadership Programme and the INDEPTH Fellowship Programme, cross-site small grants programme. And at a broader network level, we help speed up the creation of new HDSS centres, and assist centres in developing regional groups and teams.

■ INDEPTH gives priority to outcomes that are measured poorly by other data systems.

Data Integration & Sharing

A major focus of our capacity strengthening work is to improve data sharing among members and with the broader scientific community and the public. To this end, in July 2013 we launched the world's first online data repository specialising in longitudinal individual exposure and cause-specific mortality data from health and demographic surveillance systems located in low- and middle-income countries. The INDEPTH Data Repository (www.indepth-ishare.org), an online, free-access archive of high quality datasets from member centres, facilitates data sharing by developing standard measuring tools and presentation formats. Each dataset in the repository is documented according to internationally accepted metadata



standards by the Data Documentation Initiative (DDI), which enables users to quickly identify and download the data they need. The repository is a long-term project, and the datasets will continue to expand in the coming years. The datasets integrated today contain anonymised, quality assured data for every observed individual demographic event recorded among about 800,000 individuals representing more than 3.7 million person-years of observation.

The repository is complemented by INDEPTHStats, a website which is freely available and allows users — across the globe — to explore basic demographic indicators from our member centres (see www.indepthishare.org/indepthstats). INDEPTHStats indicators include crude birth and death rates, age-specific fertility rates, infant and child mortality rates, and numerous other health and demographic indicators. Additional indicators, such as death rates by cause of death, will soon be added. The data provide researchers, government officials, policymakers and the general public with basic health and demographic information that can guide their decision making.

In addition, our work on adult health and aging led to the INDEPTH-SAGE initiative, a partnership with WHO, whereby publication of a journal supplement was accompanied by public release of the full dataset used. The dataset is accessible on INDEPTH, WHO and other websites such as that of Global Health Action.

Governance of INDEPTH

INDEPTH operates on a solid governance model with a Secretariat and an international Board of Trustees whose primary role is to provide oversight and accountability for the activities of the Secretariat and the Network as a whole. The Board of Trustees appoints and supervises the Executive Director of the Network Secretariat, while the Secretariat manages the day-to-day affairs of the Network with full-time staff, supported by scientific and non-scientific staff.

The principal responsibilities of the Secretariat are to identify key health and social issues and questions that need to be investigated and to generate funding for and coordinate the network-level studies and evaluations that



In June 2000, the first INDEPTH scientific meeting brought together 17 member centres and 100 scientists. By November 2013, almost 300 scientists from the 42 member centres attended the twelfth INDEPTH Scientific Conference in Johannesburg, South Africa. They were joined by the INDEPTH Board, the INDEPTH Scientific Advisory Committee and representatives from funding partners. Over 50 scientific papers arising from the work of INDEPTH members were reviewed.

aim to answer these questions. It also works to promote HDSSs and their capabilities, including by publishing and disseminating results to impact health and social policy and practice, and by positioning INDEPTH among regional and international institutions.

A Scientific Advisory Committee advises the INDEPTH Board and Secretariat on matters relating to the scientific activities of the Network and helps to ensure that the highest scientific standards for network activities are maintained. The primary activities of the committee include:

- Reviewing for scientific rigor and policy impact the current portfolio of INDEPTH network-level studies and impact assessments
- Suggesting additional topics for research or other network activity
- Identifying new sources of funding opportunities to support these additional topics
- Considering ethical issues related to the scientific programme and making recommendations to the board
- Supporting the INDEPTH Working Groups through technical input or review of their scientific programmes



THE WORK TOMORROW

IDENTIFYING INTERVENTIONS AND POLICIES THAT ADDRESS THE BURDEN OF DISEASE

In the coming years, INDEPTH aims to maximise its exceptional potential as the world's leading LMIC platform of HDSS centres engaged in ground-breaking comparative and collaborative population-based research. Building on an extended strategic development process in 2011 and 2012, as well as an independent review funded by one of our key donors and discussions with

a range of internal and external stakeholders, our strategy for 2013-2016 will focus on the three core activities of the INDEPTH Network, and will position the network as a key player in the global health field.

■ **INDEPTH is analysing the extent to which current approaches to vaccines may have negative effects on child survival, and developing recommendations for improved approaches.**

Research

The first core business line is research. Our aim is to better understand the demographic and health trends transforming LMICs, and to identify the most effective policy interventions for improving the health and living standards of people in low- and middle-income countries.

INDEPTH is committed to working for fuller exploitation of members' data. At the same time, regional or global priorities, such as those identified in the post-Millennium

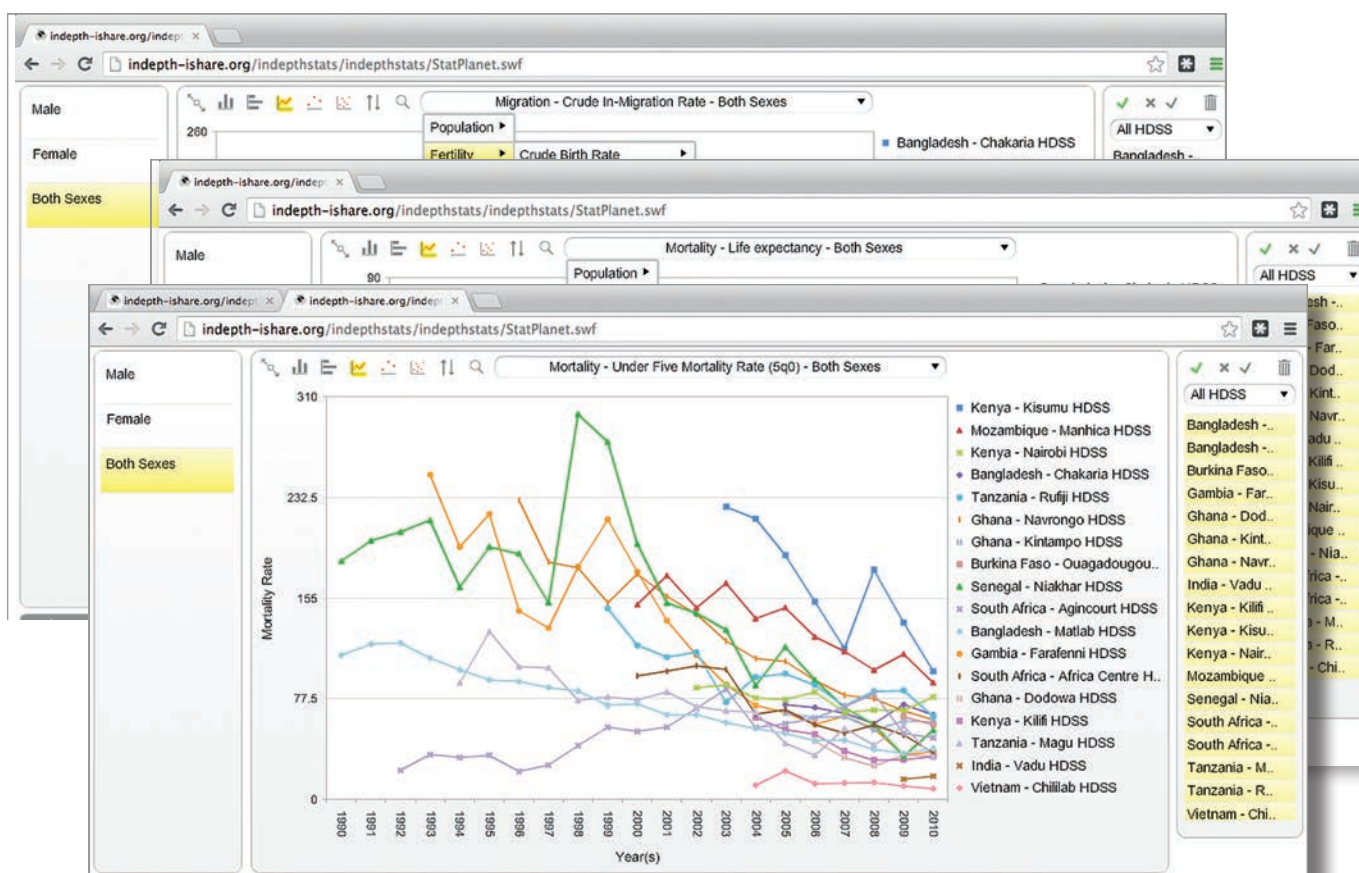
Development Goal (MDG) discussions or in the World Health Organisation's Global NCD (non-communicable disease) Risk Factor Surveillance initiative, will be highlighted and supported as much as possible. In the next few years



All HDSS Sites carefully check data collected by interviewers. Many are equipped with laboratories to conduct additional tests as needed by studies.

we will endeavour to improve the effectiveness and efficiency of Working Groups via guidelines, training, funding and administrative support through satellite secretariats. INDEPTH already has high-functioning examples of this: the Secretariat for the INDEPTH Effectiveness and Safety Studies of Antimalarials in Africa is stretched between Accra, Tanzania and Nairobi, while the Secretariat for the research effort on Adult Health and Aging, and Migration, Urbanisation and Health is stretched between Accra and Johannesburg.

In addition to the comparative studies pursued by Working Groups, INDEPTH will also mine the data it collects to identify new uses and insights. INDEPTH will commission a series of 'Illustrative Analyses' — working with centres to research strategically important topics and demonstrate to other members what can be achieved with their data. The Network's recent volume on



INDEPTH Stats (INDEPTH-ishare.org) provides interactive web access to data from member sites across low- and middle-income countries — allowing scientists and policy makers to analyze data across geographies on multiple indicators of fertility, mortality, migration and population.

‘Environmental Factors and Malaria Transmission Risk’ as well as peer-reviewed journal supplements in *Growing Older in Africa and Asia*, analyses of mortality clustering, and *Migration and Health Dynamics and Climate Change and Mortality* are a few such illustrative analyses.

INDEPTH exists to improve the amount, quality and impact of the research conducted by members. To do this, INDEPTH and member centres need to collect high-quality health and demographic surveillance data, analyse these data to generate findings, and make standardized data series and datasets available to the wider scientific community. The independent evaluation of INDEPTH’s work noted that members are using their data more effectively than a decade ago and credited INDEPTH with contributing to this both through our capacity strengthening activities and by implementing cross-site studies.

Building on this, INDEPTH will look to increase the Network's scientific productivity, and during the next four years will focus on an interrelated set of issues that are delaying the production of health statistics and preventing scientists elsewhere from maximising the value of the data. The network will do that by creating metadata, increasing the cross-site comparability of the analytic variables, and supporting data sharing. INDEPTH members are already implementing standardised tools, including the Verbal Autopsy, and an important new vehicle is the iSHARE2 initiative, in which 11 member centres are planning to display their data freely on the web. This project will enable even more member centres both to share data and to improve the quality of data collected.

INDEPTH is keen to strengthen its role as a quality controller, and will invest resources to assure high quality, policy-relevant and effective data are generated by all member centres. We already have a minimum data set condition for full membership — an error rate of 2.5% — and the Secretariat has established an experienced data quality inspection team, along with a resource centre for data assurance on its website. The resource centre contains tools including plausibility checks for HDSS data, a list of common errors, the INDEPTH Starter Kit to assist the establishment of new HDSS members, and the INDEPTH Resource Kit, which assists older members to improve their operations and output.

Policy Engagement and Communication

Our second core business line is policy engagement and communication. It is not enough to simply develop the information base when we know that much available evidence is not being used by policy-makers. The next phase of INDEPTH's development will therefore focus on both higher quality research outputs, and fostering the use of the evidence we generate. In the coming

■ The Vadu HDSS site showed the continued importance of iron deficiency anemia, leading to Indian officials decision to distribute micronutrient Sprinkles.

■ INDEPTH is providing the first true assessment of cause of death across sites — enabling a better understanding of the real burden of disease — and how best to allocate resources to address those burdens.

years we will take steps to tailor, package and direct research outputs for different audiences and stakeholders, thereby reducing the critical gap between research findings and action. We will also facilitate much wider access to and use of the longitudinal population-based data generated from HDSS studies, particularly via the iSHARE platform.

Most important, INDEPTH will work to create an ongoing dialogue among the Secretariat, the research centres and policy makers — at the local, national, regional and global level. The dialogue will seek both to identify policy recommendations that emerge from the

network's research and to set priorities for policy questions that demand research at the INDEPTH sites. The dialogue will speed the network's ability to inform policy makers about what we are learning in our research — and it will enable us to design research that truly informs policy.

INDEPTH has raised the profile of Health and Demographic Surveillance System sites as a source of critical health and development research and information, but more can be done to facilitate translation of findings into policy and practice. We need to improve our reputation and that of our members as effective suppliers of high-quality health statistics that inform health policy and practice. We will therefore make efforts to strengthen links with international agencies, scientific networks and associations whose mission aligns with ours, as well as with routine health information systems so that members' data becomes integrated into national systems and thereby has a stronger influence on policy. At the national level, the Network will help members to build closer relationships with stakeholders such as Ministries of Health, National Statistical Organisations and local universities.

Our methods for enhancing policy dialogue and communicating new knowledge to potential end users will include encouraging and

supporting Working Groups to publish research findings and policy analyses in varied formats, including peer-reviewed articles in international journals, working papers and research reports, policy briefs, fact sheets, media releases and newspaper articles. We will also establish a regular document series, including, for example, a dynamic 'Burden of Disease Profile,' to translate the Network's research findings for a policy audience. Our emphasis wherever possible will be on open access.

In addition, we will look to set up a "Policy Advisory Council" with representatives from sites, national Ministries of Health and global and regional health organisations as well as the INDEPTH Secretariat. The Council will enable the two-way dialogue we seek to achieve between the researchers designing studies within INDEPTH and the policy makers seeking to implement the best possible health programs today. It will help set priorities for the policy questions that INDEPTH should develop intervention studies to address, and help ensure that policy makers use the results of INDEPTH studies to improve health practice across LMICs.

We will assess existing policies and the policymaking environment, and on the basis of evidence, make relevant recommendations, and we will continue to organise forums, meetings and briefings with key stakeholders, and increase our participation in international conferences and agenda-setting meetings.

Capacity Strengthening

The third core business line is capacity strengthening. Our goal is to enhance the ability of the Network to meet our objectives of conducting multi-centre studies, and we have engaged in an extensive program of capacity strengthening among member centres, primarily by conducting workshops to address deficiencies in data collection, management and analysis as well as harmonising the relevant instruments.

We will continue to help develop the talent of promising and productive scientists in INDEPTH member institutions and enhance members' capacity to conduct world-class research. This will include training to enhance the

skills of field scientists in research data management, measurement disciplines, longitudinal analysis and study design, and strengthening cross-site data management by applying best practice methods of harmonising, storing, curating and sharing epidemiological and demographic data.

A critical avenue for furthering these efforts is the introduction of a new MSc in research data management. This is part of our ongoing efforts to promote academics in the Global South and assist them to conduct world class health and demographic research. The MSc will be delivered in partnership with the University of the Witwatersrand in Johannesburg, South Africa, building on the existing well-established MSc in Population-based Field Epidemiology. This programme will be informed by the needs of member centres and the advice of the Board and the Scientific Advisory Committee.

Performance Measurement

Performance measurement will be central to the next phase of the Network's growth and evolution. Not only are funders increasingly requiring it, but it is vital that INDEPTH monitor its productivity in such domains as publications, graduate students, dataset production and policy translation. Measuring our impact will help to clarify our value proposition to a wider range of stakeholders.

Intermediate performance indicators, which will cut across our three business lines, will allow for a complete view of the Network given our inherent inter-relatedness. Regular tracking towards defined targets, moreover, will help identify critical issues as they arise so that they can be addressed in good time. To this end the Network has developed a results-based monitoring system with a log frame to report on outputs and outcomes of its Strategic Plan.

SUPPORT FROM EXTERNAL REVIEWS AND AUDITORS

The INDEPTH network has received very positive feedback from external reviewers and auditors.

Reviewers have recognised both the value of the platform that links together the 42 member HDSS centres as well as the investment in skills and technology that enable research on key challenges in LMICs.

In 2010, **Dr. Samson Kinyanjui** and **Prof. Ian Timaeus**, in an evaluation commissioned by SIDA, on behalf of all funders wrote, “INDEPTH ... 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.

The reviews have recognized the value of the institution that has been built since 2000. “INDEPTH member centres have developed world-class facilities and staffs,” wrote reviewer **Paul Rosenberg** in 2012, “that have the ability to compete on the world stage. These assets are the result of years of investing in institution building at the Secretariat and throughout the network. They form the backbone for landmark multi-centre studies in malaria prevention, vaccination and child survival, sexual and reproductive health and others.”

Rosenberg, formerly with the William and Flora Hewlett Foundation, highlighted the unique value of the network’s data. “There are few, if any, research organizations that are structurally designed, as INDEPTH is, to answer the most important questions in development. INDEPTH’s longitudinal data design is uniquely structured to answer questions about impact, which is what every donor fundamentally seeks when considering funding research. No other organization has the infrastructure nor the expertise to be competitive with INDEPTH on these grounds. Now that INDEPTH has fortified the quality and consistency of its data, the opportunity is ripe to develop [other landmark multi-centre projects.]”

In addition to recognizing the strength of the scientific platforms and database, external auditors have certified the financial and management processes of the Secretariat. Auditors from **PwC Sweden**, working in accordance with International Standards on Auditing and on behalf of a funder, Sida, examined and approved the approach the Secretariat took with respect to Financial Management, Financial Reporting, Risk Management and Procurement.

INDEPTH Members, Staff and Funders

INDEPTH MEMBER SITES

(AS AT MARCH 2014)

WEST AFRICA

Kaya HDSS, Burkina Faso
Nanoro HDSS, Burkina Faso
Nouna HDSS, Burkina Faso
Sapone HDSS, Burkina Faso
Ouagadougou HDSS, Burkina Faso
Taabo HDSS, Cote d'Ivoire
Farafenni HDSS, Gambia
West Kiang HDSS, Gambia
Dodowa HDSS, Ghana
Kintampo HDSS, Ghana
Navrongo HDSS, Ghana
Bandim HDSS, Guinea Bissau
Nahuche HDSS, Nigeria
Bandafassi HDSS, Senegal
Mlomp HDSS, Senegal
Niakhar HDSS, Senegal

EAST AFRICA

Butajira HDSS, Ethiopia
Dabat HDSS, Ethiopia
Gilgel Gibe HDSS, Ethiopia
Kersa HDSS, Ethiopia
Kilite Awlalo HDSS, Ethiopia
Kilifi HDSS, Kenya
Kisumu HDSS, Kenya
Kombewa HDSS, Kenya
Mbita HDSS, Kenya
Nairobi HDSS, Kenya
Ifakara HDSS, Tanzania
Magu HDSS, Tanzania
Rufiji HDSS, Tanzania
Iganga/Mayuge HDSS, Uganda
Rakai HDSS, Uganda

SOUTHERN AFRICA

Karonga HDSS, Malawi
Manhica HDSS, Mozambique
Africa Centre HDSS, South Africa
Agincourt HDSS, South Africa
Dikgale HDSS, South Africa

ASIA

Bandarban HDSS, Bangladesh
Chakaria HDSS, Bangladesh
Matlab HDSS, Bangladesh
Ballabgarh HDSS, India
Birbhum HDSS, India
Vadu HDSS, India
Purworejo HDSS, Indonesia
Kanchanaburi HDSS, Thailand
Chililab HDSS, Vietnam
DodaLab HDSS, Vietnam
Filabavi HDSS, Vietnam

OCEANIA

PiH HDSS, Papua New Guinea
Wosera HDSS, Papua New Guinea

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Prof. Thomas Williams, Kilifi HDSS

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Prof. Pham Dung, Hanoi Medical School

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(AS AT MARCH 2014)

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Mr. Raymond Akparibo, Accountant

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(AS AT MARCH 2014)

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FUNDERS OF THE INDEPTH NETWORK

(AS AT MARCH 2014)

Bill & Melinda Gates Foundation
(Project)

Danish International Development
Agency / Staten Serum Institute
(Project)

Doris Duke Charitable Foundation
(Core)

European Union / Staten Serum
Institute (Project)

European Union / Heidelberg
University (Project)

Institute for Health Metrics and
Evaluation (Project)

National Institutes of Health / Wits
Health Consortium (Project)

Rockefeller Foundation (Project)

Swedish International Development
Agency (Core)

Swiss Tropical and Public Health
Institute (Core)

Umea Centre for Global Health
Research (Core)

Wellcome Trust (Core / Project)

William and Flora Hewlett Foundation
(Core / Project)

PREVIOUS FUNDERS

Andrew Mellon Foundation (Core)

Canadian International Development
Agency (Core / Project)

DFID/Institute for Development
Studies, Sussex (Project)

DFID/London School of Hygiene and
Tropical Medicine (Project)

International Development Research
Centre, Canada (Project)

Volkswagen Foundation (Project)

World Bank / Global Forum for Health
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WHO (Project)

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This brochure seeks to present INDEPTH — a vibrant global organisation of currently 42 member health research centres, running 49 HDSS field sites in 20 countries in Africa, Asia and Oceania — its achievements and its goals for the future.



BETTER HEALTH INFORMATION
FOR BETTER HEALTH POLICY

INDEPTH Network Secretariat
Accra, Ghana
www.indepth-network.org