PRRINN-MNCH

Partnership for Reviving Routine Immunisation in Northern Nigeria; Maternal Newborn and Child Health Initiative

Technical briefs:

Sharing the lessons learned in Northern Nigeria

The writing of this set of Technical Briefs has drawn on the work of all the PRRINN-MNCH employees and consortium members, and the commitment and contribution of health workers and communities at LGA, state and federal levels. For this we are extremely grateful.
The writers and editors of the set include Andrew McKenzie, Cathy Green, Paula Quigley, Sally Findley, Jan Hofman, Michael Siebert, Adetoro Adegoke, Anthony Aboda, Ahmad Abdulwahab, Fatima Adamu, Solomon Mengiste, Godwin Afenyadu, Gary Forster and Farsight Media.
Design by Atyeo Linklater. Photographs largely supplied by Okikiola Akinkugbe.

Contents:

Overview

This set of Technical Briefs highlights key achievements from the PRRINN-MNCH programme in Northern Nigeria under one of four streams of work: Governance and systems; Health service delivery; Community engagement and Evidence for decision-making. This is part of a package of materials including a Final Report and a set of Knowledge Summaries.

Covering a population of over 19 million, PRRINN-MNCH was an innovative DFID/Norwegian Government funded programme (2006-2014), established to address these health issues. The consortium managing PRRINN-MNCH consisted of three partners (Health Partners International as lead partner, with GRID Consulting Ltd and Save the Children) as well as several associates.

The programme combined health systems strengthening with routine immunisation and maternal, newborn and child health interventions, merging horizontal and vertical approaches simultaneously. PRRINN-MNCH aimed to revitalize Primary Health Care and improve the availability, quality and utilization of maternal, newborn and child health services, including ante-, peri- and post-natal care, emergency obstetric newborn care, essential care for newborns and infants, young child feeding and nutrition, and routine immunisation against preventable diseases.

PRRINN-MNCH assisted each state (Katsina, Zamfara, Jigawa, Yobe) to achieve significant improvements in health indicators, by supporting many federal, state and local government health systems strengthening and service delivery initiatives, in combination with community engagement efforts.

Independently verified Evidence of significant programme impact includes dramatic reductions in the infant mortality rate, reduced from 90 to 56 per 1000 live births, while the under five year mortality rate was reduced from 160 to 90 per 1000 live births. There was a significant increase in fully immunised children coverage from 2.2% to 19.3% and births attended by skilled birth attendants increased from 11.2% to 26.8%.

Some communities in Katsina are now celebrating two years of no maternal mortality, results that can be directly attributed to the work of PRRINN-MNCH.

PRRINN-MNCH has consistently exceeded expectations and the programme 'made outstanding achievements in a very difficult environment'[1].

1. Duby, Fiona (August 2012) PRRINN-MNCH Annual Review 2011: DFID Report

Addressing human resources

for health services in Northern Nigeria

Key messages: **Northern Nigeria faces critical shortages of skilled birth attendants and other health workers – this is exacerbated by poor human resources (HR) management.**

1. PRRINN-MNCH has developed a human resource management toolkit to support better planning, management and development of human resources for health.
2. The goal of having a functional and fully populated HR information system that is regularly updated is almost achieved.
3. Next steps required to consolidate the achievements include providing senior managers with accurate HR information and strategies for improving performance; developing additional modules in the HR system; and rolling out the remote access, web-based module of the system.

The challenge: deploying the right health staff in the right places

Human resource (HR) planning, management and development forms the foundation of effective health service delivery by ensuring that the right people with the right skills are appointed in the right posts, at the right facilities. In order to achieve this, it is necessary to establish the right foundations, with supporting and expanding HR interventions.

In resource-scarce environments, like the four states in Northern Nigeria supported by the PRRINN-MNCH programme (Jigawa, Katsina, Yobe and Zamfara), issues around availability and deployment of human resources for health (HRH) are important challenges for health systems at primary and secondary levels. For example, a critical shortage and poor distribution of skilled birth attendants (SBAs) were identified during baseline surveys in these states. Service delivery is severely affected by staff shortages, but also by inappropriate posting of health staff.

The critical foundation to address all of these issues is human resource information. Without accurate, reliable and readily available information, HR planning, management and effective use becomes very difficult.

PRRINN-MNCH conducted a comprehensive baseline survey in the target states and identified a number of HR issues that needed to be addressed.

The obstacles to effective HR planning and management and health service delivery in Northern Nigeria are:

- No formal HR department or personnel administration system
- Lack of basic employee data, such as date of birth, appointment and leave taken
- Management of personnel not perceived as being critical for effective service delivery
- Ad hoc personnel management which does not follow policy regulations or strategic planning
- Ineffective leave management and control at health facility level, leading to high levels of absenteeism and shortage of staff
- Weak recruitment and deployment practices
- Inadequate supply of health personnel from training institutions
- Poor distribution of health personnel, with a preference for urban headquarters and local government area (LGA) head offices, leading to critical shortages in primary health care (PHC) facilities in rural areas
- Inadequate mix of staff at health facility level
- Allocation of salaries outside the service grading system for specific posts
- Ineffective performance appraisal, leading to staff demotivation
- High turnover of staff, including human resource information system (HRIS) personnel, leading to lack of institutional memory and need for continuous re-training of new staff
- Centralised personnel administration system at the State Ministry of Health (SMoH) level
- Limited dissemination and use of key HR indicators and trend reports.

THIS DOCUMENT IS ONE OF A SERIES OF TECHNICAL BRIEFS THAT DRAW ON THE ACTIVITIES, RESULTS AND LESSONS LEARNED FROM THE PRRINN-MNCH PROGRAMME

The response: a human resource strategy with all the right tools

PRRINN-MNCH responded with an approach involving practical and strategic initiatives at all levels of the public health care system – from the facilities to the Ministry of Health (MoH). These initiatives were integrated within the Northern Nigerian context and existing procedures and processes:

Comprehensive human resource audits were conducted in each of the programme states. These audits included the development of preliminary staffing norms and the assessment of existing staffing levels. Comparative analysis from these audits informed the majority of other initiatives revolving around improving HR within the states.

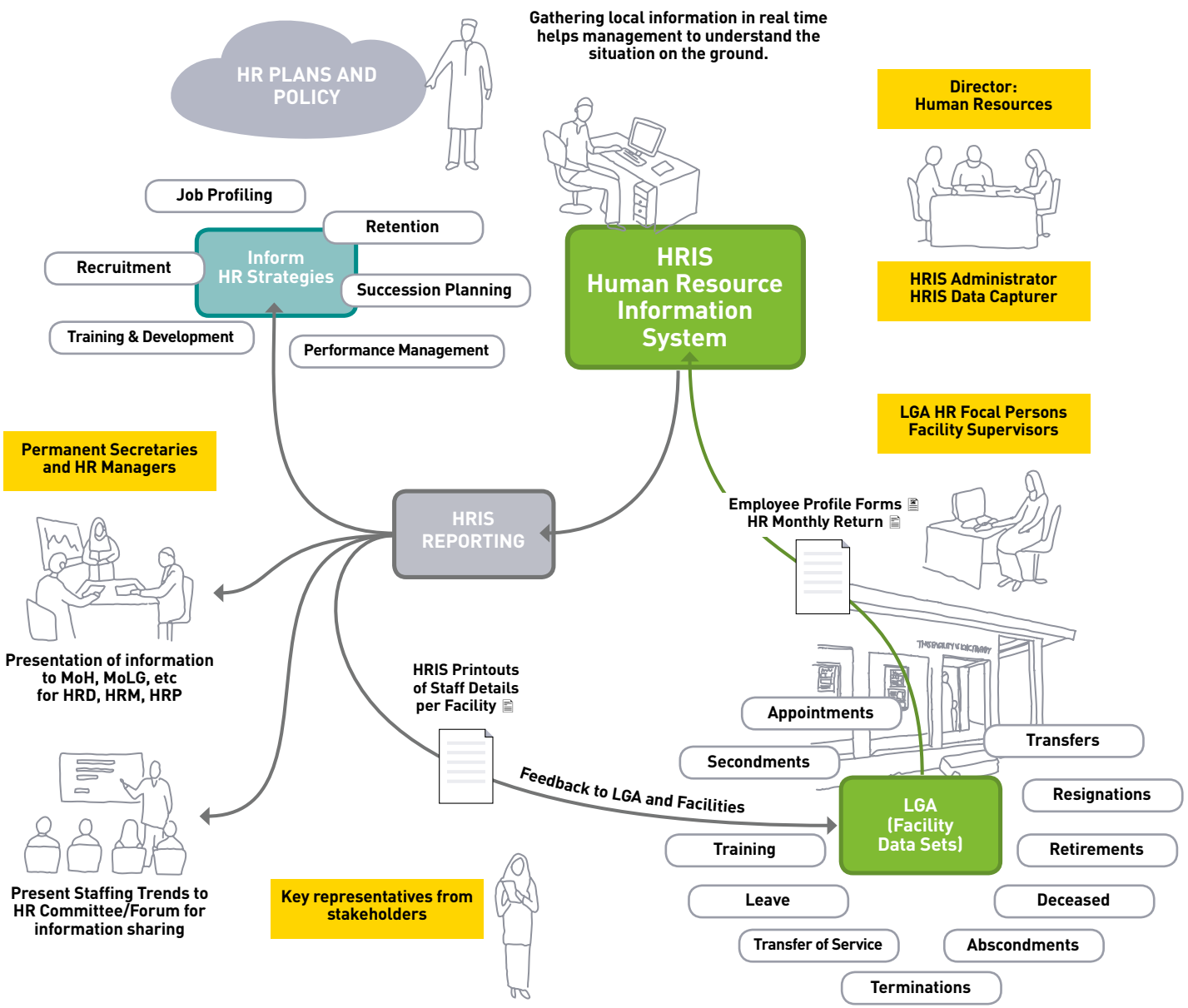
Human resource units were established and supported at state level to perform HR planning, management and development as a strategic input into high-level health service planning. Continuous capacity-building was developed through the practical training and development of many officials.

A human resource management toolkit was developed containing strategic, theoretical, practical and technical approaches for improving HR planning, management and development.

Human resource coordinating committees (HRCCs) were successfully established in each of the states with a mandate to oversee all HR-related aspects within the health sector. These committees have developed action plans to improve the HR situation.

A human resource information system (HRAdmin) was developed specifically for the unique Northern Nigerian context to effectively manage staff information. This includes HR information flow, collection and maintenance tools. Two paper-based documents were developed: an employee profile form used for all new employees and a monthly return sheet, designed to capture

HRIS process and data flowchart



staff movements such as transfers, promotions, secondments, resignations, abscondment, training and development and leave.
All current health workers employed in the public health sector in the programme states are captured on the HRAdmin and reporting is made on a regular basis. Current numbers are: Jigawa – 7,383; Katsina – 11,181; Zamfara – 10,919; and Yobe – 6,618.

The HRIS process and procedure flow was designed, presented and implemented in all the states, and is outlined in the flowchart opposite.

The results: effective systems based on accurate information

Within the above context and challenges around HR data for action, PRRINN-MNCH established sound solutions in a challenging environment.
Through the design, development and implementation of HRIS it provided much-needed baseline data that is real-time, accurate and a true reflection of the ground-level situation. The HRIS can now provide a wide range of 26 different reports on human resources.

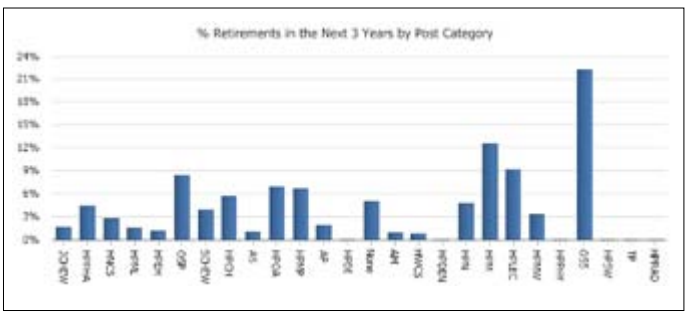
The reports are grouped in these categories:

- Employee information reports
- Training information reports
- Appointment information reports
- Age and gender information reports
- HR indicator reporting

All these reports can be generated with pre-defined selection criteria based on geographical, facility type and post category options. Below are some examples of the indicator reports (Fig 1). These reports are useful in replacement planning (first report) and in addressing imbalances in gender balance (second report).

In each state, HR units with HR officers have been established. The HR officers have been trained in HR functions, HR data flowcharts, HR data procedures and HRIS use. The primary output of a successful HRIS is a functional and fully populated HRIS system that is regularly updated. This is nearing completion and when complete can provide information that is used regularly for decision making. A training information management system (TIMS) module was recently added to the HRIS to manage the large volume of training that occurs in the health sector and which takes substantial funding from both government and development partners.

Fig 1. Examples of reports



Workforce Gender Analysis			
Indicator	n	N	Value
Workforce Female/Male Ratio (%)		12985	15% Females : 85% Males
Females in Management Posts	13	264	5%
Females in Health Professional Medical Doctor Posts	8	121	7%
Females in Health Professional Nursing Posts	215	684	31%
Females in Health Professional Midwife Posts	24	62	39%
Females in Health Professional Community Health Posts	30	338	9%
Females in Senior Community Health Extension Worker Posts	159	812	20%
Females in Junior Community Health Worker Posts	117	568	21%
Training & Development			
Indicator	n	N	Value
Employees Obtaining any Career Development	629	11957	5%
Employees Obtaining any Qualification	543	11957	5%
Employees Completing any Course	30	11957	0%
Employees Completing any Training	70	11957	1%

Policy implications

There are a number of ways in which the achievements and progress made by PRRINN-MNCH can be further enhanced to create even more sustainable solutions to the HR management, planning and development challenges faced by the states.

1. Provide senior Ministry of Health managers with accurate HR information and strategies for improving performance

Establishing the HRAdmin as an integrated day-to-day HR information management tool was a challenging exercise due to political, logistical and capacity constraints. These challenges were addressed through awareness-raising and advocacy initiatives.

Designing a protocol for the use of HR information at a senior, strategic level could significantly improve the staffing situation in rural and urban, secondary and primary health care facilities. Senior Ministry of Health managers should receive the processed information with strategies to tackle problem areas, based on existing performance reviews.

2. Design, develop and implement leave management and performance appraisal modules in HRAdmin system

Leave management: During the HR audits conducted in the four states (which included selected site visits to rural and urban primary and secondary health care facilities), it was evident that leave management was not a high priority which was resulting in a high level of absenteeism and subsequent problems with service delivery. The development of a comprehensive leave management module as part of the existing HRAdmin system will enable managers at facility, LGA and state level to monitor, track, analyse and plan leave schedules much more effectively. This would include annual, study, training, compassionate and maternity leave.

Performance appraisal: The HR audits and additional surveys also indicated that staff morale, commitment and motivation was low, making the retention of critical staff such as midwives and other SBAs difficult, especially in the rural areas. Current

retention strategies have had some positive results but they could be further improved through effective performance appraisal.

The development of a comprehensive performance appraisal management module as part of the existing HRAdmin HRIS developed by PRRINN will enable facility, LGA and ministry managers to monitor, track, analyse and plan performance appraisals much more effectively and fairly. Analytical reporting on performance trends will be designed and included in the various levels of reporting up to MoH level, for strategic planning.

The existing HRAdmin framework was developed with the flexibility to ensure that additional modules, such as these two, can be added.

3. Integrate the assessment of facility use and staff distribution through web-based HRAdmin and HMIS

The use of standardised, scientific staffing norms or ratios within the health care context is becoming increasingly important in ensuring the affordable, accessible and equitable distribution of health professionals and other health care workers. There are various models for workforce requirement planning which includes population-based, workload based and historical allocation based on various demands from different groups.

Integrating the HR use and distribution information from the HRAdmin and the data from the HMIS which PRRINN-MNCH also supported, such staffing norms can be developed. This will enable monitoring of staff allocation against activity levels within any given facility. Managers will be able to identify underperforming facilities in relation to staff allocated (facilities might be overstaffed) and overloaded facilities which might be understaffed. States are also in the process of finalising the MSP (minimum service package) modelling. Analysis from the integration between HRAdmin information and HMIS information would inform the MSP resulting in accurate staffing and costing requirements which are equitable and more affordable.

4. Roll out the remote access, web-based module of HRAdmin and continue to train HRIS officers in its use

The HRAdmin system established the foundation for decentralised HRIS. The rollout of the web-based HRAdmin version will be conducted through initial piloting and then subsequent rollout to all LGAs in states. This web-based approach will enable operational HR data to be captured on-site.

Within the remote access module, a new security access system will be developed to ensure protection of sensitive data and also to ensure that all data actions are legitimately captured and authorised. LGA and selected facility HR staff members will be trained to use the system. This training will include the full cycle of data collections, capturing processing, reporting and utilisation. At central MoH level, HRIS officers will be trained in the central HRIS management cycle which will include the integration of LGA data sets, data verification, data aggregation, reporting and dissemination of high-level strategic HR information sets. Comparative analysis between facilities, wards and LGAs will be possible at SMoH level.

Conclusion

HR management in the Northern Nigerian states is in the early stages of development. HR planning, management and development were not seen as a core function but as an administrative support task which resulted in a significant gap in effective health care provision as human resources consume the largest portion of the health budget.

Continuous development and training of HR officers, managers and support personnel on best HR practices, methodologies, approaches and techniques are crucial to establish institutional memory in the states. PRRINN-MNCH developed a HR Management Toolkit consisting of key areas of HR management, planning and development. However this toolkit needs to be expanded to include aspects which at the time of development were not seen as critical.

Once the HRAdmin initiatives are developed and implemented, the staff of the HR units of states will be trained in each practical aspect of personnel administration and HR planning, management and development. This will be done through classroom-based theoretical training, in-service practical training and case study reviews applicable in the Northern Nigerian context.

HR coordinating committees and other key stakeholders have also been trained in the interpretation of HR information and in establishing processes and procedures for effective problem solving techniques at strategic and middle management level. Key HR indicators within the different cycles of HR management have been developed and are reviewed on a scheduled basis as part of the integrated performance review approach to effective HR management.

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The PRRINN-MNCH programme is funded and supported by UK aid from the UK Government and the State Department of the Norwegian Government. The programme is managed by a consortium of Health Partners International, Save the Children and GRID Consulting, Nigeria.

Retaining skilled birth attendants in Northern Nigeria

The challenge: a shortage of skilled birth attendants

In 2010, an estimated 40,000 Nigerian women died from complications in pregnancy and childbirth[1]. Although this represents a decline in maternal deaths compared to the 1990 figures, many could have been prevented by the presence of a skilled birth attendant[2] – 61% of childbirths in Nigeria occur without one.

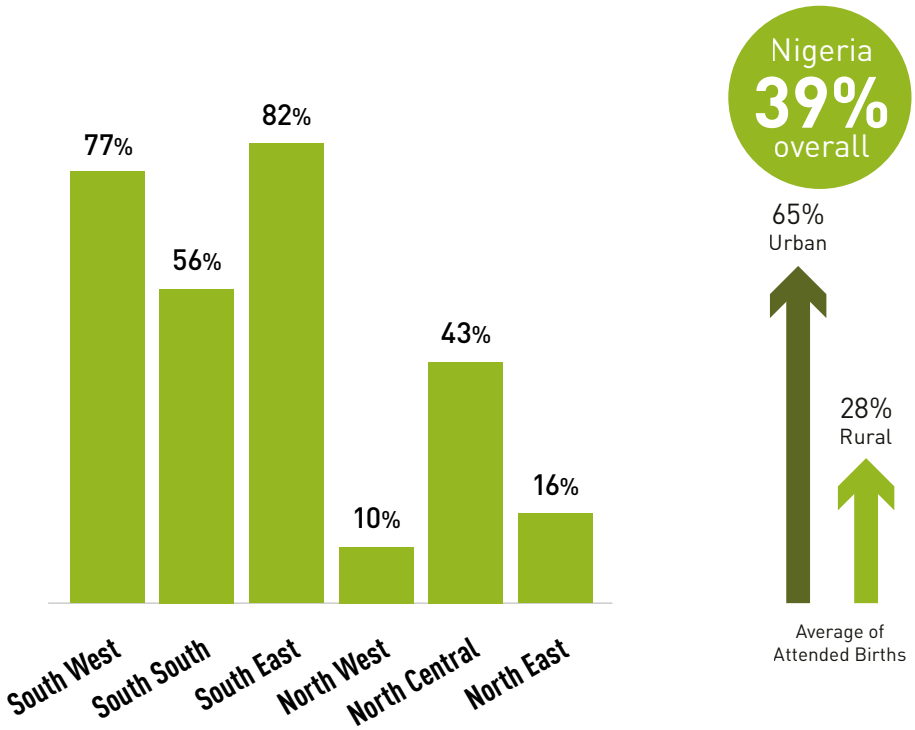
A skilled birth attendant (SBA) has been defined by the World Health Organisation (WHO) as an 'accredited health professional, a midwife, nurse or doctor, with midwifery skills'[3].The proportion of births attended by an SBA is one of the indicators used to assess the achievement of the fifth Millennium Development Goal (MDG 5) to 'improve maternal health'.

The international community set targets of 80% by 2005, 85% by 2010 and 90% coverage of births by an SBA by 2015. However, in 2008 only 65.7% of all women globally were attended to by an SBA during pregnancy, childbirth and immediately postpartum – with only 39% coverage in Nigeria[2&3]. The national coverage underscores the even lower SBA coverage in the northern part of Nigeria[2].

Key messages: **New initiatives are helping to combat the shortage of skilled birth attendants in the region.**

1. The critical shortage of skilled birth attendants (SBAs) in the northern states is a significant factor in maternal fatalities – 40,000 Nigerian woman died in pregnancy and childbirth in 2010.
2. Recruitment and retention of SBAs have been hampered by inadequate training and supervision of staff as well as some cultural norms in the area.
3. Significant progress has been made in increasing coverage and availability of midwives in rural health facilities resulting in more than double the number of deliveries conducted by SBAs.
4. PRRINN-MNCH conducted surveys to identify issues and highlighted measures to attract and retain SBAs including improved education and career structure, as well as motivational incentives.

Fig 1: Proportion of Nigerian births attended by skilled birth attendants



Nigeria is one of the 57 countries experiencing a critical shortage of SBAs, especially in remote rural areas and in the northern states[4].

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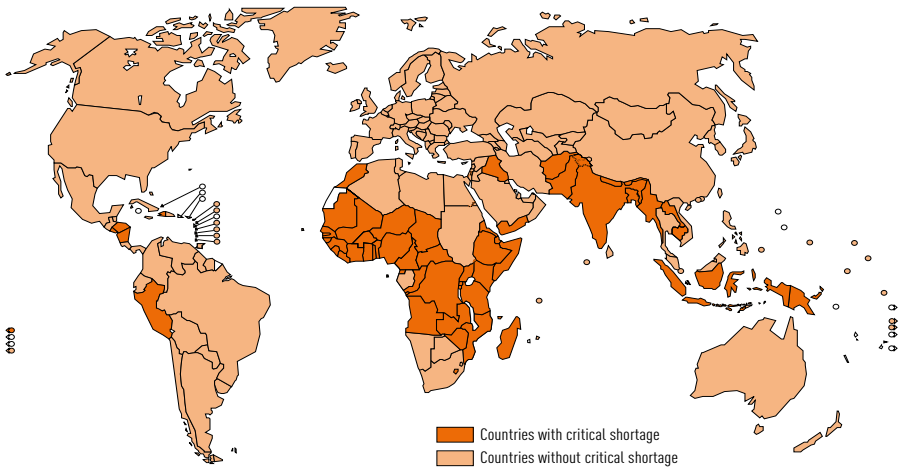
Fig 2: Countries with a critical shortage of health workers

Source: Global Atlas of the Health Workforce (http://www.who.int/globalatlas/default.asp), World Health Organization.



In most primary health care (PHC) facilities in the northern states, deliveries are conducted by male community health extension workers. They generally lack midwifery skills and it is not culturally acceptable for them to attend to mothers during childbirth. Indeed, most women prefer to give birth at home. Without significant action to address this human resources crisis, the Nigerian health system will not be able to deliver the care required to meet the Millennium Development Goals by the year 2015.

The shortage of SBAs in Nigeria has been attributed to inadequate training, low recruitment, unequal and inefficient distribution and poor retention of SBAs. Although most people in Nigeria live in rural areas, most of the Nigerian health workers are in urban areas.

Northern Nigeria

Shortages of SBAs are caused by a number of factors. These include:

- An inadequate number of institutional and practical training sites
- Varying standards in pre-service education
- Poor absorption into the workforce (eg there is a health worker recruitment embargo in some northern states)
- Ineffective deployment of health staff
- Poor monitoring, supervision and regulation

These factors are exacerbated by the social and cultural norms in Northern Nigeria. Women need permission from their husbands to seek medical attention and visit a healthcare facility. Permission must also be sought from fathers if a girl-child wishes to complete her education and qualify as a health worker.

Cultural preference is given to marriage and family life and many female health workers may refuse rural postings due to a perceived fear that their marriages may be threatened or they may lose family ties. It is also not culturally acceptable for young, unmarried girls to live far away from home without the protection of their fathers.

The response: attracting, recruiting and retaining SBAs

SBAs save lives and provide quality care during pregnancy and childbirth. In recognition of this fact, global, regional and national initiatives increasingly focus on the training and retention of quality SBAs. An adequate health workforce is vital for effective health services and achieving improved health outcomes[5].

The National Midwifery Service Scheme (MSS) is one approach introduced by the government of Nigeria to address the SBA shortage in rural areas. Since 2009, unemployed, retired and newly graduated midwives are deployed to PHC facilities in rural areas of Nigeria[6]. The state governments of Jigawa, Katsina, Yobe and Zamfara also increased SBA salaries.

Since 2008, PRRINN-MNCH has been supporting the Nigeria government to improve attraction, recruitment and retention of health workers[7-8] in these states.

National and state level policy support

- Providing technical support to the National Primary Health Care Development Agency and the Federal Ministry of Health at the national level in the design, implementation and evaluation of the MSS programme
- Consultations with policy and decision-makers on incentive mechanisms to attract, recruit and retain female health workers
- Design and implementation of an incentive package in four states to attract, recruit and retain SBAs in rural health facilities
- Supporting the development of a Foundation Year Programme in 12 health training institutions to increase the number of girls meeting admission requirements.

Skills building initiatives to improve birth attendance skills included:

- Strengthening the capacity of health training institutions (HTIs) to increase the number and quality of SBAs, through ensuring accreditation and capacity-building of tutors on effective teaching skills
- The induction and orientation of MSS midwives deployed to PRRINN-MNCH states (Katsina, Yobe and Zamfara);
- Capacity-building of MSS midwives and other midwives in emergency obstetric, focused antenatal and postnatal care, family planning, integrated management of newborn and childhood illnesses, essential newborn care/helping babies' breath, kangaroo mother care, quality improvement and supportive supervision

Advocacy

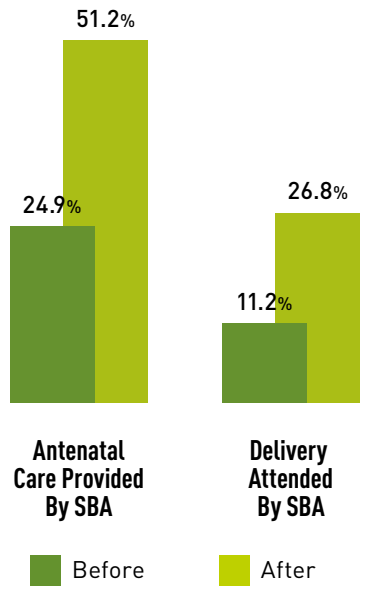
This involved the introduction of community dialogue to increase girl-child education.

Monitoring and evaluation

This involved research to explore the job satisfaction and retention of midwives in the three northern states and the evaluation of the incentive package to monitor progress, identify hitches and possible solutions.

The results: changing patterns

Household surveys by PRRINN-MNCH show that both antenatal care and deliveries conducted by an SBA more than doubled in the three states (Katsina, Yobe and Zamfara)



Before = Baseline data 2009 After = Endline intervention sites 2013

Coverage and availability of SBAs in PRRINN-MNCH targeted facilities

Accredited training institutions

Baseline	Target 2013	Progress
2	8	4

Midwives working in programme-supported facilities

Baseline	Target 2013	Progress
12	310	334

Deliveries per year attended by skilled birth attendants

Baseline	Target 2013	Progress
8,172	382,629	297,349

The three indicators relating to coverage and availability of SBAs show that while the number of accredited training institutions has increased, targets have not yet been reached. This activity is now being led by the Women for Health (W4H) programme, and the expectation is that the targets will be reached.

Fig 3: Factors affecting retention of midwives as identified by currently employed MSS midwives and those that left

Current midwives

(from focus group discussions)

- ☑ Expectations and motivation from MSS programme
- ☑ Adequate reward
- ☑ Suitable accommodation
- ☑ Availability of senior member of staff in the facility to support and mentor MSS midwives
- ☑ Availability of equipment and essential drugs
- ☑ Language and communication ability
- ☑ Acceptable workload
- ☑ Adequate supervision

Drop-out midwives

(from exit interviews)

- ☒ The job is not a permanent one
- ☒ Crisis in Yobe state
- ☒ Issues related to allowances (salary)
- ☒ Difficult and rural environment
- ☒ Accommodation problems
- ☒ Leaving for further education
- ☒ Marital and family reasons
- ☒ Distance

The number of midwives working in PRRINN-MNCH supported facilities has surpassed the target, while the number of deliveries conducted by an SBA is around 80% of the cumulative target.

Basic emergency obstetric care (BEmOC) facilities providing deliveries 24/7 by trained staff

Baseline	Target 2013	Progress
n/a	72	77

Targeted comprehensive emergency obstetric care (CEmOC) facilities with at least 6 (nurse) midwives

Baseline	Target 2013	Progress
1	18	22

Targeted BEmOC facilities with at least 2 midwives

Baseline	Target 2013	Progress
3	65	63

Targeted primary healthcare centres with at least 1 midwife

Baseline	Target 2013	Progress
0	72	49

The indicators relating to the functionality of health facilities show that midwives have increased in all targeted facilities with Primary Healthcare Centres showing slightly less progress.

Understanding why SBAs stay – and why they leave

Findings from an interview survey on job satisfaction and retention of MSS midwives show that of the 119 MSS midwives deployed to PRRINN-MNCH supported PHC facilities:

- 44 (**37**%) worked in 17 PHC facilities in Katsina state
- 41 (**34**%) worked in 21 facilities in Yobe state
- 34 (**29**%) worked in 13 PHC facilities in Zamfara state

Of these, **87** midwives were still working in their facilities while **32** have left.

Midwives reported that they obtained job satisfaction from:

The feeling of caring for women and children in the community

The chance to help and care for others

The feeling of worthwhile accomplishment from doing the job

The degree of respect and fair treatment they receive from more senior staff and supervisors

They were however least satisfied with a lack of:

A career perspective

Promotional opportunities within the scheme

Commitment is required to improve maternal, newborn and child health by strengthening:

1. Education and training
2. Legislation and regulation
3. Recruitment, retention and deployment
4. Professional midwifery associations

Source: United Nations: Every Woman, Every Child. 2010

Policy implications

Based on the experience of this programme and a better understanding of the motivations and challenges faced by SBAs, policy recommendations include:

- Increase the number and improve the distribution and quality of SBAs
- Lift the recruitment embargo for SBAs
- Ensure health training institutions provide competency-based education for all SBAs
- Develop policies that promote life-saving interventions by mid-level cadres of SBAs, such as midwives and community health workers
- Strengthen health systems with adequate equipment, supplies and drugs, and offer regular supportive supervision to help SBAs provide quality services
- Ensure health workers are motivated, especially in rural areas, through financial and non-financial incentives, such as car loans, affordable (and acceptable) housing, hardship allowance, education allowance for children and funding for postgraduate training
- Create future job security and a career structure for MSS midwives

Conclusions

Although progress is being made, many more maternal and child deaths could be prevented by an increase in the coverage of SBAs in Nigeria, particularly in the northern states. The education, deployment and retention of SBAs needs greater investment to fall in line with the United Nations Global Call to Action, June 2010[9].

This brief provides some practical recommendations to scale up activities and ensure greater access to essential maternal and newborn health services across Nigeria.

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Bringing primary health care under one roof

Key messages: **The Nigerian heath service is characterised by poor budgeting, weak governance and limited supply of basic medicines and equipment to clinics[1]. A strong primary health care system is a prerequisite to deliver comprehensive maternal, newborn, child and routine immunisation services.[2]**

1. Bringing primary health care under one roof will enhance coordination, collaboration, effectiveness and efficiency as well as eliminating constraints, fragmentation, managerial uncertainty and wastage of resources.
2. Restructuring health systems is a time-consuming task and understanding complexity theory is key to health systems transformation.
3. Reducing fragmentation improves health indices.

The challenge: understanding fragmented PHC services using complexity theory

Burdened with some of the highest maternal mortality ratios and child mortality rates in the world, Northern Nigeria's efforts to improve health services are continually undermined by structural and institutional weaknesses. Fragmentation of the health sector, including management of staff, funds and other resources, has been the most significant problem facing the country's primary health care (PHC) services. Accountability mechanisms are weak and the quality of health services suffer. Communities have little confidence in services and use of them is usually very low.

The Nigerian health system is underbudgeted and fragmented[1]. Only 7% of federal resources are dedicated to health. Of that, over 75% is spent on tertiary and curative care. All levels, tertiary, secondary and primary, are funded through separate channels which are not adequately budgeted, monitored or accountable to one another[2].

Efforts to improve governance and strengthen systems in Nigeria are complicated by the fragmentation of healthcare systems and resources. Vertical programming and fragmented services are anathema to those promoting an integrated approach to health care delivery.

Complexity theory has increasingly been advocated as a tool for health policy development and health systems reform[3]. In this theory, health systems are seen as open systems in which different components are interdependent and can influence each other in a non-linear fashion[4]. Non-linearity and the notion of emergent behaviour (ie behaviour that is not a property of any of the components of that system, but which results from the interactions of the components) mean that a change in one part of the system can have unpredictable 'ripple effects' in others[5].

The World Health Organisation's report *Systems Thinking For Health System Strengthening*[6], was heavily influenced by the ideas of complexity theory, and acknowledges non-linearity and interdependence in a proposed framework for health system strengthening.

Policymakers and health system reformers need to adopt a whole-system approach to ensure changes at one level will not impede changes at another. The complex adaptive systems approach reinforces concepts such as feedback loops (both positive and negative that influence the pace and direction of change); path dependence (processes with similar starting points can have very dissimilar outcomes resulting from different contexts and histories and different choices at key points); scale-free networks (incorporating focal points like key powerful people that can dominate a structure); and phase transitions (when 'tipping points' are reached and initiate change)[7].

The ideas of complexity theory are closely linked to the drivers of change (DOC) approach adopted by the Department for International Development[8] which has significantly influenced development and health system reform work in Nigeria. The DOC approach conceptualises three interacting components operating within any system and influencing change within it:

Structural features – the history of the state; natural and human resources; economic and social structures; demographic changes; regional issues; globalisation, trade and investment; urbanisation

Institutions – the informal and formal rules, such as political and public administration processes,

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that determine the realm of possible behaviour by agents

Agents – individuals and organisations pursuing particular interests: the political elite; civil servants; political parties; local government; the judiciary; the military; faith groups; trade unions; civil society groups; the media; the private sector; academics; donors

The DOC analytical approach examines the mechanisms through which power is transacted within society and the health system[10]. The DOC approach formed the basis of the political economy assessments undertaken by PRRINN-MNCH at federal and state level in Nigeria, which led to a deeper understanding of the structural features, the power relations, the institutions (particularly the informal rules) and the agents operating in the health sector[11].

Both complexity theory and the DOC approach to political economy see the health system as a whole system. Understanding the context in which potential change happens is vital for any new policy to be adopted. This requires a deep understanding of the structures, institutions and agents operating within the whole system.

However, complexity theory argues for a deeper analysis of the changes that a new policy will bring, especially a deeper appreciation of non-linearity, understanding of likely feedback loops, awareness of the key points when a theory or approach are likely to be adopted, and of the individuals who are critical to the adoption process.

PRRINN-MNCH states have adopted several strategies to address fragmentation and vertical programming. The underlying principle has been to create a unified approach so that the state can deliver healthcare services more effectively and leverage additional resources.

The response: bringing PHC under one roof

Speaking at a two-day national workshop on integrated primary health care governance in Nigeria, the Executive Director of the National PHC Development Agency (NPHCDA) said there are many challenges to running a health system in a federal government: *"The way around it is for all the authorities responsible for basic services from federal to local government levels to agree and bring their authorities 'under one roof'"*. He said primary health care under one roof would enhance coordination, collaboration, effectiveness and efficiency; eliminate constraints, fragmentation and managerial uncertainty, wastage of resources and create an enabling environment for implementation of the proposed Health Act[12].

Fig 1: Conceptual model for understanding drivers of change (DOC)

Three interacting components can influence change within the system.

Source: DFID (2004) [9]

Building on previous work funded by the UK government from 2003 under the Partnership for Transforming Health Systems Programme (PATHS1), PRRINN-MNCH supported stakeholders to:

- Use evidence to advocate for policy choices at state and federal levels
- Translate policy choices into appropriate legislation and regulations
- Develop and use enabling legislation to establish a single, decentralised health system (variants on the district health system) – bringing PHC under one roof
- Collaborate to overcome challenges in translating this policy into practice

The results: restructuring PHC services

In 2011, Nigeria instituted a national policy, 'bringing PHC under one roof' to integrate management of PHC and end fragmentation in the health sector. The policy built on the experience of the Jigawa State Gunduma Health System and the restructuring experiences of other states.

At the May 2011 National Council on Health (NCH), the apex health policy making body of Nigeria, 'bringing PHC under one roof' was approved as a policy and implementation guidelines were recommended for use by the states. A how-to manual and implementation checklist was approved by the NCH in August 2013 and in the same year a unit was established within NPHCDA to drive PHC under one roof. A national steering committee was also established to oversee implementation.

Key elements of the 'bringing PHC under one roof' policy

- ☑ Principle of 'three ones' (one management body, one plan and one monitoring and evaluation system)
- ☑ Single management body with control over services and resources (human and financial)
- ☑ Enabling legislative framework
- ☑ Decentralised authority, responsibility and accountability with appropriate span of control
- ☑ Integrated supportive supervisory system managed from a single source
- ☑ Integration of all PHC services under one authority
- ☑ Effective referral system across the different levels of care

Bringing PHC under one roof fits the provisions of the National Health Bill, which is awaiting approval and 23 states have implemented PHC under one roof in one form or another. Three national workshops have been held over the years with a state-level audit in September 2013 by NPHCDA, with support from PRRINN-MNCH to monitor progress, as well as zonal workshops in August and December 2013. Awareness of the benefits of PHC under one roof has also increased among donors and partners (eg interest shown from GAVI, EU, WHO).

In three of the four PRRINN-MNCH states the policy has been adopted and implemented and in the fourth (Katsina) the current legislation is being reviewed to align with the policy. All four states are progressing in implementing key elements of the policy. At state level:

- All 4 PRRINN-MNCH supported states have accepted the PHC under one roof policy
- Laws and regulations have been passed in three states and review of current legislation is ongoing in Katsina in 2013
- Jigawa has integrated PHC and secondary healthcare (SHC) by establishing the Gunduma Health System
- Management structures have been established in three states (excluding Katsina) and boards inaugurated in two states (Jigawa and Yobe)
- Transfer of services and resources (human, financial, infrastructure) has been completed in Yobe and Jigawa
- Capacity building of new managers of integrated authorities has started across the four states and among the Gunduma Councils in Jigawa

The results: improving access to services in Jigawa

Jigawa's Gunduma Health System amalgamated responsibility for primary and secondary healthcare services and the resources of 27 local government areas under nine Gunduma Councils which are now accountable to a single Gunduma Health System Board. In Jigawa, the Gunduma legislation was signed into law in 2007 (under the PATHS1 programme) and the accompanying regulations were signed in 2010 (with support from PRRINN-MNCH and PATHS2). This has led to a transformation in health service delivery in Jigawa.

Increased efficiency and coordination of health services (reducing duplication)

The new system has enabled the Jigawa Government to progressively increase the health budget allocation to over 15% since the Gunduma Act was signed. Budget performance has reached over 90% in the same period.

Decentralisation of health services (devolution and de-concentration)

The development of enabling legislation has helped to shift the balance of power over the management of key resources (financial and human), from politicians to managers of the decentralised health system. Fig 3 shows the shift in expenditure pattern: decreasing State Ministry of Health (SMoH) budget expenditure and increasing Gunduma Health System Board (GHSB) expenditure.

Increased confidence and use of services

Over the last five years there have been significant changes in maternal and health indices.

There have been significant increases in immunisation coverage since the Gunduma system was established. This was seen in both the household survey data and the national immunisation cluster survey (NICS) data (Figs 4 and 5).

Policy implications

It's not enough to have a good idea, backed by evidence – it needs to be translated into new policies and legislation. But to do so:

- Political will and commitment are essential
- Considerable time is needed – fragmentation is quick, integration is lengthy
- Implementation is crucial – the devil is in the detail
- Working at the governance/systems interface is key

Fig 2: Amount of state budget allocated to health (%)

Jigawa's health budget has increased since the Gunduma Act of 2007.

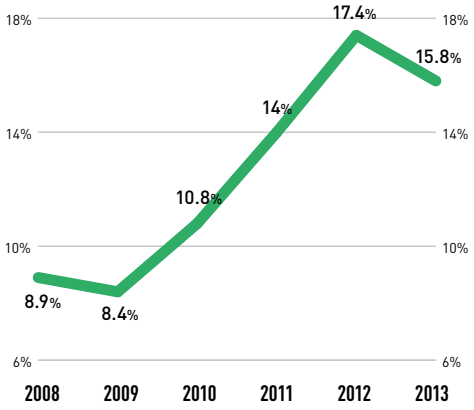


Fig 3A: Jigawa expenditure shifts

SMoH budget expenditure has declined

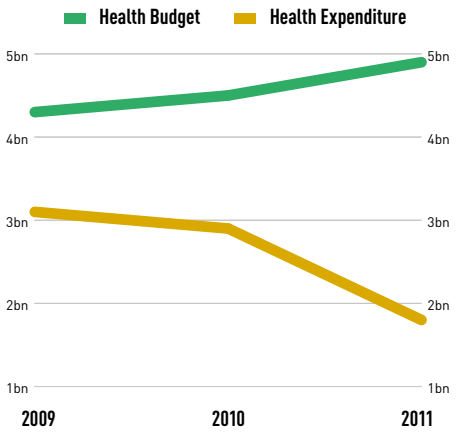


Fig 3B: Jigawa expenditure shifts

GHSB expenditure has increased

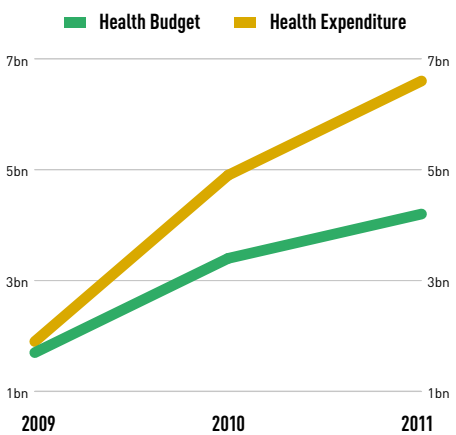
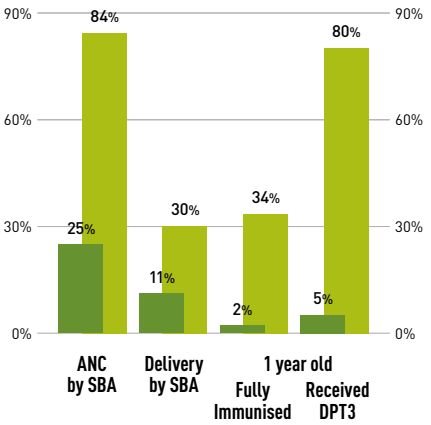


Fig 4: Changes in service provision from the PRRINN-MNCH household surveys (HHS)

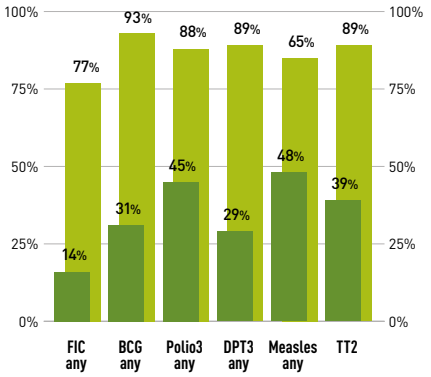
Maternal care and immunisation have improved considerably.



Baseline HHS 2009 Endline HHS 2013

Fig 5: Comparison of NICS data in Jigawa state 2006 and 2010

Immunisation coverage has improved considerably.



Baseline NICS 2006 Endline NICS 2010

Identifying and leveraging power and economic interests

Laying the foundations for the development of the PHC under one roof policy was time consuming and the advocacy approaches used were multi-pronged. Enormous, careful and sustained efforts were made to include all stakeholders at all stages of policy development – from politicians to senior government officials, service providers, progressive institutions and community leaders.

Evidence of malfunctioning health services and successes from other African countries was used to urge politicians to review policy choices and to illustrate advantages in certain policy choices.

Putting policy into practice through institutional restructuring

Practical issues such as the rationalisation of government management structures are complex in any setting, even more so when stakeholders have minimal experience of unitary and decentralised health systems. Multiple issues needed to be dealt with in an ongoing manner. The emphasis was on transferring services and responsibility from one tier of government to another. This involved the reorganisation of human and financial resources as well as the reorganisation of state ministries of health and local government area structures to play new roles.

Conclusions

Reducing the fragmentation of PHC service management is a key step in improving Nigerian health care indicators. However, this is a journey that takes considerable time and a deep understanding of the political economy of the Nigerian health sector. In addition, flexibility and perseverance are needed to see the journey through to completion.

But despite progress, some of the issues with healthcare delivery in Nigeria stem from the country's fractured federal system of governance. Much time is spent developing strategies for the entire nation, but when it comes to implementing them, the politics of federalism grind progress to a halt.

But with the primary healthcare under one roof initiative, *"we have the whole primary healthcare delivery on one platform – that is, the state's own primary healthcare development agency,"* says Dr Ado Jimada Gana Muhammad (executive director of the NPHCDA). *"The staff of the primary healthcare department in the local government departments and areas will now be absorbed into [that] agency. And we are beginning to see it work."*[13]

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Public financial management systems strengthening

Key messages: **Overcoming weak public financial management systems is both a technical and a governance issue. Solutions in both areas are needed to strengthen PFM systems.**

1. Strengthening PFM systems requires support across many components.
2. Ensuring transparency and accountability is vital.

The challenge: overcoming weak PFM systems

Finance is a major obstacle in the provision of better health services. Financial transparency and accountability are at the core of the global agenda to improve health funding, manage costs in the most effective manner and ensure value for money. For UKaid and many other development partners, value for money has become a priority.

Public financial management systems are essential for ensuring that:

- Government revenue projections are realistic
- Budgeting processes and systems are aligned with planning systems
- Financial resources are released according to approved plans
- Expenditure is linked with a monitoring and evaluation plan
- Expenditure is tracked, documented and associated with improved indicators
- Auditing processes confirm transparent and accountable processes

Since financial control is key to the struggle for political and economic power by politicians and other political stakeholders such as traditional institutions, bureaucrats and the private sector, the process of strengthening financial management in the health sector has a strong governance dimension. Strengthening PFM means taking actions that could potentially affect a range of powerful individuals and groups. Challenges include:

- Political interference, often leading to unrealistic fiscal projections, overbudgeting and ultimately central allocation of resources for political priorities
- Irregular and incomplete release of budgeted funds due to poor fiscal projections
- Limited capacity of administrators to defend their budgets
- Poor memo writing leading to limited release of budgeted resources
- Inadequate oversight by the legislative arm of government, especially at state and local government area (LGA) levels, leading to a failure to call the executive branch to account
- Distortion of budget processes and implementation due to the absence of transparency and accountability at all levels
- Weak capacity and commitment of budget planning teams grounded in their past experience where budgets and planning were seen as futile
- Poor resource mobilisation, coordination and harmonisation of funds at federal and state levels due to vested interests of development partners
- Limited capacity of the state assembly and non-governmental organisations (NGOs) to track budget allocations and budget releases

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The response: strengthening PFM teams

The approach focuses on increasing health sector access to financial resources and ensuring that health managers use financial resources in an accountable and transparent manner. This guarantees value for money and provides a safety net for the poor and those at greatest risk. Since 2009 PRRINN-MNCH has supported these five areas:

Budgeting:
This includes strengthening the annual budget process through budget planning, budget preparation, budget execution (accounting, auditing), budget monitoring and evaluation; expenditure tracking by line item and programme; tracking of health sector budget performance through design of programme and sub-programme budget structures; capacity building and advocacy.

Public health expenditure reviews:
This includes introducing and supporting the concept of regular budget activity reviews at 3-6 month intervals. Expenditure reviews look at budget release and expenditure as well as the relationship between release and service provision.

Financial management system strengthening:
The focus is on strengthening state and LGA financial management systems which covers the State Ministry of Health (SMoH) and its agencies, including PHC boards and the Gunduma system, state medical stores, LGA health departments and health facilities, with a special emphasis on drug supply systems.

Supporting PHC under one roof:
This includes establishing 'pooled funds' that require state and LGA joint financial contributions, building the capacity of the managers of pooled funds and the provision of financial and operational manuals and guidelines for pooled funds.

Mobilisation of federal government PHC resources by states and LGAs:
This includes designing, streamlining and strengthening financial mechanisms for leveraging funding from federal to state and LGA levels for immunisation and health care.

Success in leveraging extra resources for health

Basket fund in Zamfara

To strengthen PHC delivery in Zamfara a pooled fund (called the basket fund) was created. State, local government and development partners contributed and the funds were used for tasks such as supervision, vaccine distribution and outreach services. This has contributed to improved immunisation coverage, among other service improvements.

GAVI funds

Many states did not have the mechanisms in place to effectively retire GAVI funds for strengthening health systems. Before 2009 none of the states had accessed more than one tranche of funding. Following support provided to access and retire these funds, performance in the states has improved and GAVI funds are available on an ongoing basis.

Using the MDG funds in Jigawa

MDG funds were made available for states to access. The creation of an integrated health system in Jigawa (the Gunduma system) allowed for single integrated health plans to be developed. This has meant that multiple funding sources can be used to strengthen the healthcare delivery system. Using a Minimum Service Package approach, the Gunduma Board has directed MDG funds for maintenance and refurbishing of facilities in the state. In 2009 ₦377 million was spent in this way and ₦609 million in 2010.

The results: better use of increased financial resources

At federal level, PRRINN-MNCH support has assisted in:

Leveraging of financial resources including support to lobby for Global Alliance for Vaccines and Immunisation (GAVI), Millennium Development Goal (MDG) and other development partner funds to Nigeria and to the PRRINN-MNCH supported states

Designing and building the capacity of NPHCDA to manage GAVI funds via the development of guidelines and manuals as well as training of staff

Building government capacity to access Subsidy Re-investment and Empowerment Programme (SURE-P) health funds

At state level, PRRINN-MNCH support included:

Establishing budget and planning committees in the PRRINN-MNCH states and building their capacity to use PFM guidelines and manuals. The training has covered use of budget templates, unit costing, tracking tools and processes

Support to introduce appropriate budget codes in health budgets to improve budgeting and expenditure tracking

Strengthen capacity to access funds through memo writing (and documenting of previous impact) enabling the states to advocate more effectively for the release of budgeted funds

Establishing budget monitoring and tracking systems in all four states

Introducing a culture of regular budget reviews at state and sub-state levels ensuring that budget and expenditure figures are available and that financial data are reliable

Integrating budgets and plans at state, Gunduma and PHC board levels

Separating the budget by department and unit and add specific monitoring and evaluation (M&E) targets

Health expenditure (₦1bn) per annum by state

	2009	2010	2011	2012
Jigawa	5.2	7.7	10.3	11.8
Katsina	5.9	3.6	6.1	8.1
Yobe	2.8	2.4	3.5	1.8
Zamfara	3.0	3.8	4.2	3.8

Negotiating the joint account between states and LGAs as these are centrally controlled by the governor and impact on budget release particularly at LGA level

Supporting the establishment of pooled funds by developing financial management guidelines and training stakeholders in their use

Strengthening advocacy to policy makers and influential people to improve health funding

Aligning planning, budgeting and review processes:

- All four PRRINN-MNCH states and many LGAs have costed annual plans aligned to their respective strategic health plans, the available budget envelope and in line with the budget cycle
- All four states have monitoring and evaluation (M&E) frameworks to measure performance
- A system of performance reviews has been introduced in all four states
- Expenditure tracking tools are available and are being used to inform management decision making

In most states, health sector budgets are more realistic and better linked to annual health plans. Jigawa and Zamfara have developed medium term expenditure frameworks and access to financial data at state and LGA levels has improved significantly.

Data on the percentage of the total budget allocated to health (Fig 1) illustrate how far states have come in reaching the target of 15% of total budget stipulated by the 2001 Abuja Declaration. However, the picture is rather mixed. In Jigawa 12% of the entire state budget was allocated to health in 2012, while Zamfara achieved just over 6% (a decrease on the previous three years).

More importantly, analysis of total expenditure on health (table, below) shows that Jigawa has more than doubled its health expenditure in the last four years, Katsina has increased its expenditure by approximately 35% and Zamfara by 30% while Yobe was increasing but declined in 2012.

Analysis of per capita spend provides additional insights into changes in government health expenditure. The pattern shows an overall increase in three states, and a decrease in Yobe.

Data on per capita spend (in $, Fig 2) illustrate how close the states are to reaching the WHO minimal level of around $42 per capita per annum. In all cases, the states have a long way to go before they reach the WHO benchmark. However, the analysis in Fig 2 does not include LGA, Federal Ministry of Health (FMoH) or federal ministries, departments and agencies (MDA) expenditure. To obtain a full picture of per capita expenditure, reliable data relating to all three levels needs to be captured but is not yet available.

A further indicator is budget performance (Fig 3) which in the health sector is a measure of how accurate government fiscal projections and budgeting processes are, and also how good the budget releases are in relation to the budget. Health budget performance is good in Jigawa, improving in Katsina and deteriorating in Yobe. Zamfara presents a mixed picture, initially improving but deteriorating in 2012.

There are three major components to the budget (personnel, overhead and capital). Often there is overbudgeting and under-spending on the capital component, but excellent budget performance on the other two components. The Zamfara graph (Fig 4) illustrates that budget performance (for personnel and overhead) improved, reaching over 100% and total spend (for personnel and overhead) increased for the years 2009-2011. However there was a decline in 2012, contrasting with overall budget performance between 60-70% (with an equal decline in 2012).

Fig 1: Percentage of total budget allocated to health

Jigawa has nearly doubled its health budget, but Yobe's has declined.

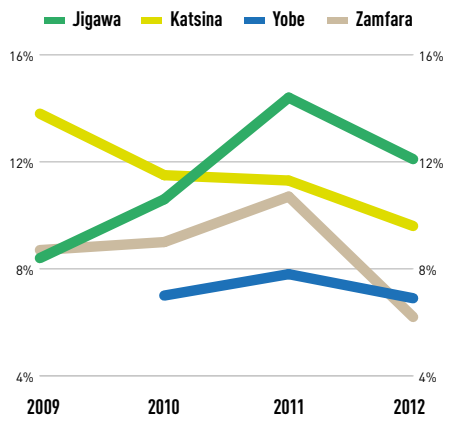


Fig 2: Per capita expenditure

Jigawa is closest to reaching the WHO minimal level of around $42 per capita per annum.

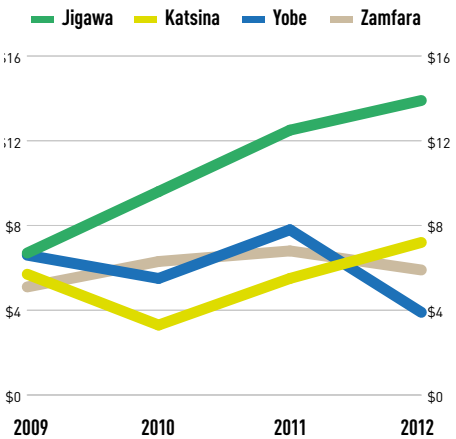


Fig 3: Budget performance

Jigawa performed well, Katsina improved but Yobe and Zamfara declined.

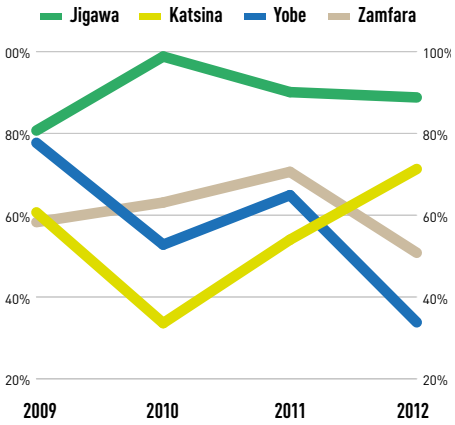
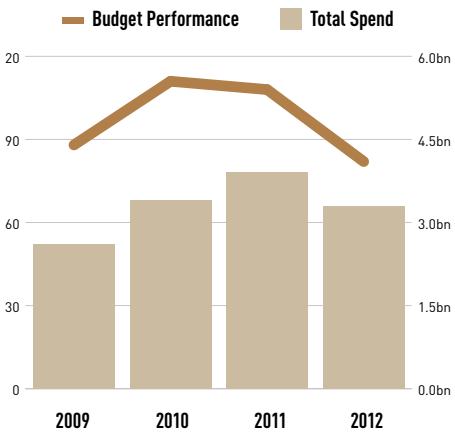


Fig 4: Zamfara – personnel and overhead budget performance

Budget performance for personnel and overhead improved and reached over 100%.



Policy implications

Probably the two most important components of a functional health system are finance and human resources. Neither of these is easy to deal with and both require technical and governance expertise. To strengthen PFM systems requires the capacity to work in several technical areas at the same time. These include strengthening financial management systems but also supporting revenue projections, aligning financial and budgeting skills with planning, monitoring and reviews. Allied to these technical aspects is the capacity to engage with political stakeholders and communities. If the governance aspect is ignored, then any changes are unlikely to take root and flourish.

Conclusion

Tackling weak PFM systems requires both technical and governance expertise. It also requires building trust over a long time. There are no quick fixes in strengthening PFM systems and many hiccups and challenges are to be expected along the way.

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Influencing policy and fast-tracking implementation

The context: using complexity theory to drive policy development

Underpinning our approach to strengthen policy development and fast track implementation is a profound comprehension of complexity theory and the drivers of change analysis, and the links between the two.

Complexity theory has increasingly been advocated as an approach for health policy development and health systems reform[1].

With complexity theory, health systems are seen as open systems in which different components of the health system are interdependent and can influence each other in a non-linear fashion[2]. Non-linearity and the notion of emergent behaviour (ie behaviour of a system that is not a property of any of the components of that system but a result of the interactions of the components) mean that a change in one part of the system can have unpredictable 'ripple effects' in other parts of the system.[3,4]

Another key property of complex systems is the different structure that the system has at different levels and the need for policy makers to be aware of the 'view' from the different levels. Thus, for example, in Nigeria the decision to run supplemental immunisation activities to eradicate polio through door-to-door campaigns over many years (micro-level) has meant that people no longer want to attend regular health services (macro-level), expecting all health services to be delivered to their doorsteps. Thus a focus on the micro-level has impeded change and development at the macro-level.

It is important to ensure that the different structures are understood and incorporated coherently into policy changes so that changes at one level will not impede changes at another level. This is often not fully understood and is critical for those using complexity theory in the health sector.

The complex adaptive systems approach reinforces concepts such as feedback loops (both positive and negative that influence the pace and direction of change); path dependence (processes that have similar starting points can have very dissimilar outcomes resulting from different contexts and histories and different choices at key points); scale-free networks (incorporating focal points – including key powerful people – that can dominate a structure); and phase transitions (when critical 'tipping points' are reached and initiate change).[5]

To a large extent, the notion of complexity theory is linked to the drivers of change (DOC) analysis adopted by DFID[6,7] (Fig 1) which has influenced development and implementation of the health system reform work in Nigeria.[9,10,11] The DOC approach conceptualises three interacting components operating within any system and influencing change within that system.

Key messages: **Complexity theory and the drivers of change analysis can be used to analyse health systems and drive the development and implementation of policy.**

1. Ensuring policy adoption requires an understanding of the political economy.
2. Making policy choices entails recognition of the health system as a complex system.
3. Complex systems do not respond in a prescribed manner, they require flexibility and adaptability.

Fig 1: Conceptual model for understanding drivers of change (DOC)

Three interacting components can influence change within the system.

Source: DFID (2004)[8]

THIS DOCUMENT IS ONE OF A SERIES OF TECHNICAL BRIEFS THAT DRAW ON THE ACTIVITIES, RESULTS AND LESSONS LEARNED FROM THE PRRINN-MNCH PROGRAMME

The DOC analysis and approach is essentially one of politics and power and the mechanisms through which that power is transacted within society and the health system.[12,13] The DOC approach spawned the political economy assessments at federal and state level in Nigeria[14] which led to a deeper understanding of the structural features, the power relations, the institutions (particularly the informal rules) and the agents operating in the health sector. The political economy assessments assisted in evaluating different policy options and identifying levers to advocate for different policy options. This is very similar to the approach advocated by complexity theorists.[15,16]

Both complexity theory and the DOC/ political economy approach see the health system as a whole system. Any new policy development needs to understand the context for the potential change. This context requires a deep and ongoing understanding of the structures, institutions and agents operating within the whole system. However, complexity theory requires a further understanding of the changes that a new policy will bring (especially a deeper appreciation of the non-linearity, the likely emergent behaviour and the 'view' of the different structures at different levels of the proposed policy change). Only then, and in an ongoing fashion, as the context and the whole system is dynamic, can policy be developed and implemented.

The response: complexity theory in practise

PRRINN-MNCH has supported many new policy initiatives since 2008 and ensured that most of them have been fast-tracked. In this technical brief, some of these initiatives will be described in the context of complexity theory. Seven key components are used to analyse the PRRINN-MNCH approach in each initiative. These include:

Non-linearity (action/behaviour that does not flow in a straight line)

Emergent behaviour (behaviour as a result of the interactions of the components of a system)

Different level views (understanding interaction between different levels)

Positive and negative feedback loops (influence changes)

Path dependence (key bifurcation choices affect outcomes)

Scale-free networks (hubs aligned with powerful people)

Phase transitions (tipping points)

Not all the components apply in equal measure to each policy initiative.

1. Bringing PHC under one roof (PHCUOR)

This policy initiative spearheaded by the National PHC Development Agency (NPHCDA) is designed to overcome the fragmentation of the PHC system. Previously provision of services, financial and human resources and the supervision of PHC services was dispersed among many different role players. The PHCUOR policy was approved by the National Council of Health in 2011 and has since been implemented in at least 23 states.

Non-linearity (action/behaviour that does not flow in a straight line) States adopted the PHCUOR because they saw it as a way to access funds proposed in the draft health bill and not necessarily because they were convinced of the merits.

Different level views (understanding interaction between different levels) The policy influences the power relations between state and LGA levels and between politicians and health administrators. Significant care was taken to ensure full understanding of all stakeholders and in creating a system that was largely a win-win for all.

Positive and negative feedback loops (influence changes) Jigawa's strong showing with improved immunisation coverage in the 2010 NICS (national immunisation cluster survey) influenced other states to adopt the PHCUOR policy.

Path dependence (key bifurcation choices affect outcomes) Jigawa chose to bring both PHC and SHC (secondary health care) under one roof, while Yobe and Zamfara only chose PHC.

Scale-free networks (not uniform but have hubs aligned with powerful people) Early adoption of PHCUOR by the Health Reform Foundation of Nigeria (HERFON) Board led to adoption by the NPHCDA – the chair of the HERFON board was also the chair of the NPHCDA board.

Phase transitions (tipping points) Adoption of PHCUOR in 2011 by the NCH was the tipping point for the adoption of the policy by the states.

2. Community responses to obstetric care emergencies – standing permission, emergency transport schemes (ETS), blood donor groups and saving schemes

Obstetric care emergencies are complicated by delays in making decisions to seek care (first delay), delays in accessing care (second delay) and delays in providing care (third delay). Many of the delays occur within the community and various strategies have been adopted to address the delays. These include pregnant women obtaining standing permission to seek care when necessary (addresses first delay), emergency transport and saving schemes (addresses second delay) and blood donor groups (addresses third delay).

Non-linearity (action/behaviour that does not flow in a straight line) Communities have taken it upon themselves to inform neighbouring

communities which have adopted the same approaches.

Emergent behaviour (behaviour as a result of the interactions of the components of a system) ETS drivers have waived their charges in many cases and also guide pregnant women through the health system and wait for them in case they are needed to transfer them to higher levels of care.

Positive and negative feedback loops (influence changes) ETS drivers are rewarded by getting to the front of the queue at motor parks which has helped them provide the ETS.

Scale-free networks (not uniform but have hubs aligned with powerful people) The inclusion of the National Union of Road Transport Workers (NURTW) has meant that the emergency response strategies have been widely adopted across the different states in Nigeria.

3. Adopting the DHIS2 (District Health Information System)

In 2002, PATHS1 (Partnership for Transforming Health Systems) introduced the DHIS1.4 to Nigeria. This was adopted by the FMoH (Federal Ministry of Health) as the database for the national HMIS (health management information system). DHIS1.4 is not web-based. In the middle of 2013, HISP-Nigeria (Health Information Systems Project) convinced the FMoH to adopt the web-based version, DHIS2.

Emergent behaviour (behaviour as a result of the interactions of the components of a system) A key component of the introduction of the DHIS1.4 was the development of a local support company (HISP-Nigeria). This was the body that drove the introduction of the DHIS2 against the considered opinion of the parent HISP company.

Positive and negative feedback loops (influence changes) Availability of state data in real time to all stakeholders in Nigeria through the DHIS2 has led to significant improvement in data collection. States have also become more aware of their data and questioned the quality of the data on the system.

Scale-free networks (not uniform but have hubs aligned with powerful people) The key director in the FMoH was always fully integrated into efforts to strengthen the routine HMIS through the DHIS. His exposure to the piloting of the DHIS2 in one state assisted in accepting the conversion to DHIS2 across the country.

Phase transitions (tipping points) The results of the piloting of the DHIS2 and the strong relationship between HISP-Nigeria and the FMoH director convinced the team to push for the adoption of the DHIS2 across the country.

4. Introducing pooled funds

Funding for PHC services has always been a significant problem in Nigeria. Zamfara state piloted the introduction of a basket fund that was used to support PHC immunisation services. Funds were sourced from state, local government and development partners. The basket fund was slowly expanded to cover all PHC services and served as a model that is being adopted by other states.

As a result of the development of the Gunduma or district system in Jigawa state, a pooled fund was created by the state government to service both PHC and SHC services. This is currently being expanded into a sector wide approach (SWAp) initiative.

Non-linearity (action/behaviour that does not flow in a straight line) The credibility that PRRINN-MNCH has developed through working on financial systems for sustainable drug supply systems (SDSS) and the GAVI fund strengthened the work on the pooled funds. PRRINN-MNCH also became the go-to group when financial systems were needed for the health component of the SURE-P fund.

Emergent behaviour (behaviour as a result of the interactions of the components of a system) Developing robust financial systems for health funds allowed states to access other funds eg the MDG fund.

Positive and negative feedback loops (influence changes) Tight financial control systems developed to ensure funds were spent according to plans and properly accounted for, ensured greater faith in the basket fund system. This helped the expansion to cover the whole PHC system in Zamfara and other states.

Path dependence (key bifurcation choices affect outcomes) Adoption of the Gunduma or district system led to a pooled fund in Jigawa for PHC and SHC, while the other states have adopted a basket fund for PHC only.

Scale-free networks (not uniform but have hubs aligned with powerful people) Initial work with key leaders in the NPHCDA on the GAVI fund ensured exposure of the basket fund to other significant stakeholders (eg Gates Foundation, WHO). This led to endorsement by these bodies and the NCH of the pooled or basket fund approach in Nigeria.

Phase transitions (tipping points) The endorsement of the basket fund by GAVI (Global Alliance for Vaccines and Immunisation) and the Gates Foundation has ensured that other states have introduced basket or pooled funds.

Conclusions

As illustrated by the examples, PRRINN-MNCH's deep understanding of the political economy of Northern Nigeria and of health as a complex system has allowed the team to punch well above its weight. The programme has seen a number of policy initiatives adopted at national level and implemented across other states. In addition, it has assisted federal-level structures in implementing key strategies in the states that PRRINN-MNCH is supporting.

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This set of Technical Briefs highlights key achievements from the PRRINN-MNCH programme in Northern Nigeria under one of four streams of work: Governance and Leadership, Health Service Delivery, Community Mobilisation, and Evidence for Decision-making.

PRRINN-MNCH worked with the federal, state and local governments, and in close consultation with local communities, to strengthen Primary Health Care services in four states, covering a population of over 19 million. PRRINN-MNCH helped each state achieve significant health-related goals, and improved the quality and availability of health services including antenatal and postnatal care, safer deliveries, care for newborns and infants, better nutrition, and routine immunization against preventable diseases.

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