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Project Report

Creating the Foundation for Health System Resilience in Northern Nigeria

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CONTENTS

Abstract—The experience of a donor-supported Reproductive, Maternal, Newborn, and Child Health (RMNCH) program in four states of Northern Nigeria illustrates how a Complex Adaptive System (CAS) approach to health system strengthening can lead to health systems becoming more resilient. The program worked with the array of political, cultural and social determinants which interact to shape the health system and its functionality. It worked in an environment marked by weak governance with little public accountability and by very limited management capability in inadequately regulated markets. To these conditions of fragility was added the shock from the rapidly deteriorating security situation caused in 2011 by the Boko Haram insurgency and the government's ensuing response.

A CAS theory of change provided the basis for the multi-faceted approach that identified critical points of leverage among institutions in social as well as professional systems and helped achieve significant improvements in health service delivery in the RMNCH continuum of care. It also established the foundation for Primary Health Care Under One Roof, which has emerged as a central national strategy in Nigeria for strengthening health sector governance and services under the 2014 Health Act.

This article draws on the experience of work undertaken in Northern Nigeria over the course of the last 10 years. A team largely of Nigerian professionals from an array of disciplines worked widely across the health system, addressing issues of governance, finance, institutional management, community systems support, access and accountability, and service delivery—frequently at the same time. This experience provides lessons for efforts elsewhere on how to strengthen health systems during and after emergencies (such as Ebola in West Africa) and in situations affected by conflict.

Keywords: complex adaptive systems, health systems strengthening, political economy, post-conflict reconstruction, resilience

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Renewed interest in health systems strengthening (HSS) for building health system resilience came with the outbreak of Ebola in West Africa in 2014.[1] When institutional and systems failure—the absence of health system resilience—aggravated the crisis, there was limited capacity, particularly

in the affected countries, to mount a timely and coordinated response. The ensuing cost in human and financial terms was huge. As the crisis unfolded, the concept of health system resilience through health systems strengthening emerged as key to reducing the human suffering and the accompanying social and economic costs associated with major disruptions such as Ebola, conflict and insecurity, and climate change.[2,3,4] Resilience is the capacity of a health system to deal with change, to adapt and transform, and to maintain relevance, when confronted by such major disruptions.[4]

In this article, we posit that that an effective and functional health system is the foundation for a resilient health system. A health system that can deliver quality coverage in the Reproductive, Maternal, Newborn, and Child Health (RMNCH) continuum of care is a functioning system.[5] A health system failing in basic functionality has little chance of developing relevance or resilience. To help understand the foundation for resilience, we examine the complex adaptive nature of health systems in the processes of health policy development, health systems reform and health systems strengthening.[6] Complex adaptive systems (CAS) theory provides a framework for understanding the array of formal and informal connections among institutions, structures, and agents that underpin the foundation for resilience.

The CAS lens informs our approach to understanding health systems strengthening, as outlined in the Flagship Report from the Alliance for Health Policy and Systems Research, and shows how a system functions and how it can be strengthened.[7] For effective functioning of a health system, all major sub-systems—finance, human resources, logistics, *inter alia*—need to be capacitated and functional. A CAS approach can improve the prospects for positive synergy among these sub-systems and the likelihood of effective responses to unanticipated challenges to a health system.

In the CAS approach, the health sector is seen as a system in which different endogenous and exogenous components are interdependent and can influence each other in a non-linear fashion. This is often referred to as an open systems and a whole system approach.[8] Notions of non-linearity and emergent behavior mean that behavior is not a property of any of the components of that system, but results from the interactions of the components such that a change in one part of the system can have unpredictable "ripple effects" in others.[9] In addition, the complex adaptive lens approach reinforces the ideas of:

- **feedback loops**, which feed into the system and explain how small changes can grow into large consequences that can reinforce a particular outcome or lead the system to go back to an original state, what is called balancing or goal-seeking loops;
- **path dependence**, which refers to non-reversible processes with similar starting points that can have very dissimilar outcomes, resulting from different contexts and histories and different choices at key bifurcation points;
- **phase transitions**, when tipping points are reached and initiate change; and
- **scale-free networks**, which refer to the formation of influential hubs or individuals that can shift the focus and power of networks by exerting higher influence on other actors in the network through their multiple interconnectedness.[10,11]

This article describes the Partnership for Reviving Routine Immunization in Northern Nigeria: Maternal Newborn and Child Health (PRRINN-MNCH) program which was undertaken in the four northern Nigerian states of Jigawa, Katsina, Yobe and Zamfara in a population of about 20 million people. These states were selected because of their high burden of disease and the absence of other major donor-sponsored programs. The article summarizes how CAS thinking guided HSS activities and contributed to the foundation for health system resilience. The article illustrates how the policy of Primary Health Care Under One Roof (PHCUOR), which started at the beginning of the PRRINN-MNCH program, became an organizing principle for HSS and emerged as a main strategy of the 2014 Health Act.

The shock of the Boko Haram insurgency tested social system functionality in northern Nigeria, with thousands of deaths, millions of internal displacements, and a significant dislocation of civil services. Nevertheless, despite these serious social disorders, the PRRINN-MNCH program led to significant improvements in population level coverage and health outcomes in an area characterized by some of the world's worst indicators for reproductive, maternal, neonatal, and child health.

THE CONTEXT OF NORTHERN NIGERIA

Northern Nigeria has significantly worse health indicators than the national averages. For example, while the 2013 Nigeria Demographic and Health Survey presents the national average maternal mortality ratio (MMR) for Nigeria as 576 per 100,000 live births,[12] studies focused specifically on northern Nigeria have estimated higher MMRs, often in excess of 1,200.[13,14] Other key indicators demonstrate a similar level of variation, with the northern states bearing the greater burden of disease, with infant mortality at 128 deaths per 1,000 live births nationally but 185 in the Northwest Zone and 37% of children stunted nationally compared with 55% in the Northwest Zone.

The structure and organization of the government health system is a major determinant of the health status of Nigerians, especially in the North where private sector health markets are limited.[15] Health services are provided by each of the three tiers of government in Nigeria: federal, state, and local government areas (LGAs).[16,17,18] In theory, the federal level is responsible for tertiary care, the state level for secondary care, and the LGA level for primary health care; in practice, there are overlapping mandates and functional programming, generally emerging from inadequate legislation, financing, or regulatory coherence.

Nigeria has gradually decentralized health system governance and financing in the decades since independence in 1960. The National Primary Health Care Development Agency (NPHCDA), created in 1992, supports the process of decentralizing and strengthening primary health care delivery. With the advent of the PHCUOR policy, which was ratified by the National Council for Health in 2011 and included in the 2014 Health Act, most states by 2015 had established state primary health care development agencies/boards of variable functionality. Building on the trend in which the proportion of public sector health budget managed at the sub-federal level doubled from 23% to 46% between 1999 and 2005, the Health Act stipulates that these Boards are to receive 50% of the newly created central health fund.[17,19] In the four states examined here, Jigawa started developing its state Primary Health Care (PHC) board in 2007, Yobe and Zamfara in 2012, and Katsina in 2015.

Despite efforts to rationalize sectoral stewardship and service provision, the Nigerian health system has remained fragmented with centralization juxtaposed with decentralization.[20–24] Capacity limitations, fiduciary risk, and political influence, as well as competing development agency agendas/requirements, often created new problems as various agencies attempted to address old problems. For example, federal level policy and oversight bodies such as the NPHCDA have slipped into implementation at the state and LGA levels, whether providing additional supervision, managing demonstration projects, or taking on initiatives to establish new primary health care facilities. Similarly, there remain issues of responsibility and accountability for key resources, with health facility staffing split between the state-level LGA service commission, which is responsible for the more senior staff, and the LGA administration, which is responsible for lower level health workers. Block grants to finance LGA-level operations are in accounts controlled by the state governor alone, contributing to inappropriate or delayed budget allocation and utilization.[25]

Nigerian health services are characterized by underinvestment and poor financial management, including poor budgeting, and limited supply of basic medicines and equipment.[26,27] Only 7% of federal government resources are dedicated to the public health sector. Tertiary, secondary and primary levels are funded through separate channels, which are not adequately budgeted, let alone harmonized, monitored or cross-referenced. The system is poorly regulated with a weak financial safety net for the poor: public sector accountability is limited with minimal investing in empowering communities to realize their health rights or responsibilities.

In this challenging setting, there are prospects for improvement. Positive developments include the passage of the Nigerian Health Act in 2014 and the peaceful transition of power to a new federal administration in 2015. The new government is setting the course for improved sectoral governance, including a functional clarification of accountabilities and responsibilities across public sector health services.[28]

THE PROGRAM

The PRRINN-MNCH was financed by UKaid from the UK Government and by the Department of State of the Norwegian Government. The program sought to improve health outcomes in the RMNCH continuum of care by improving health services in northern Nigeria. This inter-disciplinary effort focused on improving health sector governance as part of HSS, as well as community systems, as the basis for increasing demand for and supply of quality health services.

Table 1 outlines the intended outputs of PRRINN-MNCH, which cover governance and health system strengthening as well as service delivery, operations research, and community health system strengthening.

OUTPUT 1	Strengthened state and LGA governance of PHC systems geared to MNCH
OUTPUT 2	Improved human resource policies and practices for PHC
OUTPUT 3	Improved delivery of MNCH services via the PHC system
OUTPUT 4	Operations research providing evidence for PHC stewardship, and MNCH policy and planning, service delivery, and effective demand creation
OUTPUT 5	Improved information generation with knowledge being used in policy and practice
OUTPUT 6	Increased demand for MNCH services
OUTPUT 7	Improved capacity of Federal Ministry to enable states' MNCH activities

TABLE 1. Program Outputs for PRRINN-MNCH

This program ran from 2008 to 2014 and was led by Health Partners International, an African-led social enterprise based in the UK with extensive experience in Nigeria. The program focused on strengthening governance and systems at the state and sub-state levels. Program assessments, including baseline, midline, and endline surveys, were undertaken by the Columbia University Mailman School of Public Health.

This program afforded the opportunity for a staff largely of northern Nigerian professionals to improve a range of health sub-systems necessary for health services to function. These efforts drew on the medical and management sciences, as well as political economy and social sciences, in addressing the social context of institutional dysfunction, including public disillusionment with health service delivery.[29]

In addition to state-level governance and system strengthening, the program adapted the World Health Organization Emergency Obstetric and New Born Care (EmONC) service coverage model to organize capacity building for service strengthening.[30,31] The program adapted the EmONC model, adding elements of capacity building for HSS guided by a CAS approach, to focus on the program's outputs organized around "clusters" of 500,000 to 750,000 people. Although the EmONC model uses population units of 500,000 people, the low level of coverage in northern Nigeria at the time required greater reach. In each cluster, coverage in the household to hospital continuum includes primary care, Basic EmONC, and Comprehensive EmONC life-saving services. Basic EmONC includes the services required to administer essential medicines, remove the placenta or other retained products, and perform assisted vaginal delivery and neonatal resuscitation; comprehensive EmONC includes provision of surgical and blood transfusion services. By 2011, 18 clusters had coverage with basic EmONC services and by 2013 they all had comprehensive EmONC services.

This program had a broad scope and budget (involving more than £80 million or 140 million USD) and required multiple strategies, initiatives, and activities, which are beyond the scope of this paper.[32] A summary of key strategies, initiatives, and activities for each output is presented below to illustrate the program's scope.

1. Service delivery

   Coverage with EmONC services increased from less than 20% to more than 70% across the four project states. In addition to strengthening services with relevant essential service packages and health care technology, capacity building provided extensive support for improving clinical care, including skills related to building linkages with an extensive network of community based services.

2. Health workforce

   Across the EmONC clusters, capacity building focused on the institutions, systems, and individuals to enhance clinical and managerial skills for provision of MNCH services. A key drive included accreditation of new training facilities and a focus on enrolling female health workers. In addition to regular training, emphasis was placed on supportive supervision through the state health boards as well as ward health committees. Thousands of health workers from all levels of the health system participated in capacity building exercises and training suited to their respective portfolio of responsibilities. Accountability and management of human resources was strengthened with establishment of a human resource information system allowing for auditing and improved distribution of staff.

3. Information

   The program placed significant emphasis on strengthening Health Management Information Systems (HMIS) and on building accountability and "knowledge culture" in the management and use of evidence. A key drive was to support state-wide introduction and institutionalization of District Health Information System 2® (DHIS2, Health Information Systems Program-SA, Eastern Cape, Republic of South Africa), the preferred software for HMIS in more than 47 low- and middle-income countries.

   Improved data management was strengthened by regular data quality audits. Reporting regularity and accuracy increased substantially. The launch of the Nahuche Health and Demographic Surveillance System is generating vital insight into population health dynamics per se. It has also become a focus of attention in supporting evidence-based programming in demonstrating innovations through operations research.

   DHIS2 modules were introduced for health care technology management, with an emphasis on routine preventive maintenance, along with improvement in vaccine and essential medicines supply management.

4. Health financing

   There was a significant increase in both fund availability and the efficiency of their utilization. Capacity building on public financial management supported the development of costed plans from health facilities, through the LGA to state levels. At state and LGA levels, planning and budgeting tracking and relevant reporting and feedback improved. Establishment of a

pooled funding mechanism in Jigawa and a basket fund in Zamfara contributed to better alignment of funding with plans and was instrumental in increasing the level of state budget investments in health. Results-based financing (RBF) demonstration projects generated proof-of-principle that RBF approaches could be adapted to the context of northern Nigeria to increase accountability and improve services.

5. Leadership and governance

   Improved coordination of PHC services through the PHCUOR strategy and its incorporation into Nigerian national policy and state legislation was vital to the program and will have larger implications with the implementation of the 2014 Health Act. As outlined later, it improved linkage and harmonization of the policy, planning, budgeting and review cycle through state-led, health-sector wide processes.

6. Community engagement

   Following an assessment of the social and economic barriers to access and health service utilization, community-owned systems were strengthened through an integrated community engagement approach that addressed key barriers simultaneously to establish sustainable community response systems. A key outcome was increased "standing permission"—social sanction to seek health services without spousal permission—for mothers to visit health services. Extended community voice on health issues led to greater accountability of health providers and managers through budget tracking. This helped revitalize facility health committees.

BOKO HARAM

The historical, social, and political conditions that gave rise to general instability in northern Nigeria are also the genesis of the Boko Haram insurgency.[33] Compounded by global geo-political trends, including events in the Middle East and North Africa, the insurgency is far from over at the time of this writing in mid-2016. At this time, however, it seems that its worst effects in terms of mortality, internal displacements, breakdown of civil services, and the rule of law seem to be on the wane.

The impact of Boko Haram, in Nigeria in general and northern Nigeria in particular, remains complex and far-reaching. It is estimated that by the end of 2015 more than two million people had been internally displaced.[34] In 2014 alone, there were more than 7,500 official casualties,[35] with some observers suspecting the actual death toll was much higher.[36] In addition, internal migration of Christian and southern Nigerian business people and civil servants has been associated with the insurgency.[37] Overall, the prevailing view is that this brutal insurgency has delivered a massive shock to the economic well-being and social fabric of northern Nigeria.[38]

Although it is clear with hindsight that Yobe and Kano were the most severely affected of the PRRINN-MNCH states, while the project was underway, there was no clear view on where the insurgency would head. So in the absence of surveillance data to the contrary, the program assumed the possibility of conflict in all states and minimized its exposure to risk accordingly.

COMPLEX ADAPTIVE SYSTEMS APPROACH

In this setting, the PRRINN-MNCH program worked widely across the health system in northern Nigeria, addressing issues of governance, finance, institutional management, human resource management, information management, supply chain management, community systems support, access and accountability, and service delivery—frequently at the same time. Program development strategy was informed by the emerging literature on the main factors that characterize resilience. However, there is a gap as to what constitutes key metrics of resilience, so that good indicators of resilience are still lacking. It has been noted that the multidimensionality of resilience renders the application of simple metrics inappropriate, but that key aspects of resilience include the qualities of: awareness, diversity, self-regulation, integration, and adaptation.[39] Given that a significant proportion of health services focus on RMNCH, the capacity to deliver the RMNCH continuum of care is an indicator of health system functionality and effectiveness and a foundation for resilience.

Using a CAS lens, the program concluded that strengthening and building the foundation for health systems resilience in northern Nigeria would be a slow process that could only be achieved over the long term. The CAS approach suggested a methodology for health systems strengthening that would emphasize the interactions of different components of the system and require working with local stakeholders.

Table 2 illustrates how the complex adaptive systems approach was utilized in the program for PHCUOR. PHCUOR focused on reducing the fragmentation of the services through a rationalization of the governance and management of services and resources, particularly financial and human resources, by linking responsibility with accountability in state PHC development agencies.

RESULTS

The PRRINN-MNCH program contributed to the realization of many changes across a set of key output, outcome, and health indicators. These changes are summarized in Table 3

Complex adaptive system components	Primary Health Care Under One Roof (PHCUOR)
Open systems and a whole system approach *Seeing health systems as open systems, policy developers/ health system reformers need to adopt a whole system approach, understanding that different components of the health system are interdependent*.	*Key to improving health services and health indices was the importance of tackling the whole health system and not just certain aspects*. 1. The PRRINN-MNCH programs were either conceived as, or morphed into, health systems strengthening programs. Activities ranged from governance, through systems and services to community engagement and accountability. 2. The PRRINN-MNCH programs engaged government departments other than the Health ministries, departments and agencies.
Non-linearity and emergent behavior *Non-linearity and the notion of emergent behavior (i.e., behavior 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*.	*Strengthening the Gunduma Board, which is an administrative structure, had consequences for political control*. The key legislative changes in the Gunduma or district system in Jigawa meant that previously fragmented management of financial and human resources was transferred to the Gunduma Health Services Board from the state and LGA administrative structures. Several LGAs now made up a Gunduma with a new governance structure. The outcome was that administrative management and procedures now handled by the Gunduma structures were strengthened at the expense of political power and control by the LGAs.
Feedback loops *Both positive and negative; these influence the pace and direction of change*.	*Results and other activities strengthened the policy changes*. 1. Initially there was skepticism about the district development work. Following positive results (e.g., the 2010 National Immunisation Coverage Survey data[44] showed a dramatic increase in immunization coverage in Jigawa), there was renewed interest in the concept. 2. The unsigned Health Bill with an incentive of significant funding if states formed state primary health care development boards influenced the pace of state level activities. 3. The National Council of Health's memo and implementation guide on PHCUOR filled a vacuum and showed states how to proceed with "district" development.
Path dependence *Processes that have similar starting points can have very dissimilar outcomes resulting from different contexts and histories and different choices at key bifurcations*.	*Different states adopted different strategies dependent on the state specific context*. 1. A key difference was the adoption of either an integrated primary health care system (e.g., Yobe and Zamfara states) or an integrated primary and secondary health care system (e.g., Enugu and Jigawa states). This was a combination of history/context (e.g., Jigawa had no state hospital management board) and of different choices at key moments (usually by the state governor). 2. At critical bifurcations, key activities included "time-out" for reflection and exposure to success stories (e.g., Ghana). This assisted in decision making.
Phase transitions *When critical points—"tipping points"—are reached and initiate change*.	*The program ensured that key initiatives were identified and supported and the results were spread widely*. 1. For many states in the north, the critical point came with the National Immunisation Coverage Survey 2010 data[44] that showed how improved Jigawa was (other data has confirmed this). This led other states to explore variations of the integrated district or Gunduma approach. 2. The National Council for Health's decisions in May 2011 to endorse the memo and PHCUOR implementation guide and to encourage states to form state primary health care development boards initiated a rush to create these boards.

(*continued on next page*)

Complex adaptive system components	Primary Health Care Under One Roof (PHCUOR)
Scale-free networks *Incorporating focal points—including key powerful people—can dominate a structure*.	*It was seen as important to ensure that key role players were brought on board early*. 1. Key role players were part of the PRRINN-MNCH team (e.g., previous Permanent Secretary for Health). In addition, the executive director of the National Primary Health Care Development Agency (and later the minister) was an early convert and eventually drove the process. 2. At state level, similar people were identified and supported.
Views from different levels *Another key property of complex systems is the different structure which the system has at different levels and the need for policy makers to be aware of the "view" from the different levels*.	*Significant policy changes need to be viewed through the eyes of all stakeholders and from the different levels within the health sector*. The proposed policy changes would lead to altered "power" relations between state and LGA politicians, between state and LGA managers, and between politicians and administrators/managers. The "views" of these role players at the different levels needed to be factored in. This was done through retreats, exposure to best practices, and advocacy/lobbying. Ultimately, this has led to significant "repositioning."

TABLE 2. Illustrations of How the Complex Adaptive Systems Approach Influenced Initiatives *(Continued)*

and show how a CAS approach can be used to strengthen governance and systems, improve access to quality services, and enhance the mobilization/empowerment of vulnerable populations, particularly women, through community development and social engagement programing.

Program activities related to strengthening governance and systems led to increases in service use that were associated with reductions in child and infant mortality rates. Because prevailing methods for estimating MMR rely on reported historic mortality, the time lag associated with these methods may have contributed to the absence of observed improvement in MMR despite the significant improvements in use of antenatal care and assisted delivery services.[40] Observed improvements in health outcomes correspond to increases in service utilization, where the use of antenatal services and assisted delivery doubled, and coverage with Diphtheria Pertussis Tetanus (DPT3)—the proxy for a fully immunized child—increased more than 16 fold to more than 80%. It is difficult to make direct comparisons between project-specific figures and those using other sampling frames, such as the Nigeria Demographic and Health or Multiple Intervention Cluster Surveys.[41] Given Nigeria's regional variation in disease burden, key stakeholders are comfortable that these results give a reasonable estimate of change associated with program implementation, bringing the burden of disease in northern Nigeria closer to national averages.

One other indicator in particular warrants discussion: *women with standing permission to take a child to a health center*. In northern Nigeria, most rural women live in purdah or seclusion. In this context, often in polygamous families,

Selected Service & Outcome Indicators	Baseline 2009	Endline 2013	Significance
Under-five mortality rate/1,000 live births	160	102.2	7.74 (<0.001)
Infant mortality rate/1,000 live births	90	63	2.31 (0.019)
Maternal mortality ratio/100,000 births	>1,271	1190	NA
% of births attended by a skilled birth attendant	11.2	23.9	210.6 (<.001)
% of women receiving ANC by trained person	24.9	48.8	153.2 (<.001)
% of one-year olds that have received DPT3	5.1	83.3	65.4 (<.001)
% of women with standing permission to take a child to a health center	40.2	82.7	860.2 (<.001)

TABLE 3. Selected Service and Outcome Indicators for PRRINN-MNCH. Data is from the Columbia University Mailman School of Public Health baseline and endline household surveys. The data has been aggregated as the trends across the states have been similar with some differences in start and end points[45]

women have restricted efficacy to make decisions related to their children and familial well-being. During the course of the program's baseline studies, it became apparent that the absence of "standing permission" was a barrier to access for a woman or her sick child when her husband was traveling for work, whether with livestock or for business.[42] Engagement with traditional leaders as well as men from these communities revealed that the absence of "standing permission" was more a survival of earlier practice, rather than a practice of conviction. It was perhaps reinforced by a prevailing view of health system dysfunction. Improvement in standing permission rates was associated with increased service utilization and greater participation in local health committees. The demonstration of increased health service use, particularly for assisted delivery, points to an increase in health system relevance and perceived functionality to the community.

Improving these indicators across the MNCH continuum of care is itself an indicator of a better functioning health system. Improvement in the functioning of the health system was built on more accountable governance and better resource management. These improvements entailed developing clusters of functioning health facilities, improving coverage along with delivery of quality services, and a referral system as well as integrated supportive supervision. It also entailed a flow of recurrent funding for the different levels of the health system and good-enough management of finance, human resources, logistics, and the supply-chain. A reciprocal investment in community engagement and in meaningful community system strengthening contributed to enhanced trust in health services and improved accountability for their provision which helped overcome key barriers to increased demand.

DISCUSSION

Guided by a CAS theory of change, this program developed investments in HSS that contributed to a better functioning health system in four states in northern Nigeria. Progress made during the earlier part of the program was sustained, even when severely tested by the transition from restive political dissent to a situation of chronic political violence associated with Boko Haram.

The experience with the PRRINN-MNCH program suggests several key insights about building the foundation for health system resilience. First is the importance of ***an appropriate approach to stakeholder engagement***. In our experience, there are four interlocking issues to be considered:

- **Attention to engagement with stakeholders** at many levels facilitates reform. Stakeholders include politicians, government administrators and health professionals, and community and religious leaders who must lead and implement the reform process or initiatives. Their engagement is at the heart of any effort at health system strengthening, but it is not automatic or simple to mobilize. Securing stakeholder engagement requires viewing the situation through a CAS lens, with careful planning and choice of methods of engagement, and constant attention.
- **Decentralized management is needed to respond flexibly to local conditions and grasp opportunities** for addressing core elements of health system functionality as they emerge. Often, investing partners are constrained by funding proposals and plans when the situation cries out for an alternative approach or methodology.
- **Appropriate technical support is required** to assist managers battling on their own. Facilitating sharing experience from similar situations can be very valuable, ideally with peers or peers and internationals, rather than relying only on external experts.
- **An appropriate time frame is helpful** for affecting change, including time allocated to establish credibility with stakeholders. Experience demonstrates that contextual knowledge, an understanding of the complexity of issues along with international best practice, builds the credibility and trust that are key elements in achieving results and making a difference.

The second insight relates to the value of ***integrating governance reform with systems strengthening***. This link is seldom made, and the people working on improving management systems are often different from those working on governance issues. Often a purely technical approach to systems strengthening is adopted. However, all the critical systemic issues in managing health services (e.g., budget allocations and disbursement, staff management, drug procurement and distribution, and capital investment) have significant governance elements. These need to be understood, and strategies then adopted to improve systems, in the context of the prevailing governance context or, where necessary, initiatives need to be developed to ensure necessary governance reforms. Strengthening systems requires technical skills and political awareness. For systems strengthening, it is as critical to build political and institutional commitment to change, with strong local ownership integrated into locally-developed strategies and frameworks, as it is to institute technical changes to systems to strengthen systems.

Third, the most significant problem facing Nigeria's health care services is the fragmentation of the health sector,

including management of services, staff, funds, and other resources. 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. Nigeria's efforts to improve health services have been continually undermined by structural and institutional weaknesses. Vertical programming and fragmented services are anathema to those promoting an integrated approach to health care delivery. The key governance reform necessary is reducing fragmentation, in order to create a direct link between responsibility and accountability for service delivery.

All told, the process of building functioning health services in Nigeria (and elsewhere) requires building political and community support as well as technical capacity for HSS.[43] Communities and policy makers need to be fully involved. Key issues include incorporating community structures and systems and sharing information.

Limitations of this study: The PRRINN-MNCH program was designed as an implementation program and not a research project. Thus, there were no control and intervention sites in the states. The program started in some LGAs and by the end of the program, all LGAs in two states had been included in the cluster approach and in the third state half of the LGAs had been included.

CONCLUSIONS

The experience with the PRRINN-MNCH program in northern Nigeria suggests that to build a functioning primary health care system requires investment in the health system through broad-based interventions, sufficient political commitment, "flexible" resources (as compared to rigid aid or usually inflexible government funding), and continuity over a significant period of time. An approach grounded in the principles of complex adaptive systems focused on the interactions among structures, institutions, and agents in order to align the various resources—material and human—needed to build a functioning health service. The CAS lens informed the program's activities designed to address challenges, strengthen health systems, and create resilience.

Nigeria has adopted PHCUOR as the national strategy for implementing health sector governance reforms and strengthening the health system. Following its adoption by the National Council on Health in 2011, PHCUOR was included as the cornerstone of the 2014 Health Act. Each of the country's 36 states is independently considering how to implement PHCUOR. Each state has its own governor, legislature, and socio-environmental context. Local circumstances—and politics—will shape how each state proceeds. This article shows how each state can use a CAS lens to decide what to do, based on the state's particular context, in order to strengthen the state's health system and make it more resilient.

DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

No potential conflicts of interest were disclosed.

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