

Understanding factors that influence the integration of acute malnutrition interventions into the national health system in Niger

Hedwig Deconinck,^{1,*} Mahaman Elh Hallarou,² Anais Pesonen,³ Jean Christophe Gérard,⁴ Bart Criel,⁵ Philippe Donnen⁶ and Jean Macq⁷

¹Université Catholique de Louvain, Institut de Recherche Santé et Société, ²Université Libre de Bruxelles, Ecole de Santé Publique, Brussels, Belgium, ³Université Catholique de Louvain, Faculté de Médecine, Brussels, Belgium, ⁴Save the Children, Niamey Niger, ⁵Institute of Tropical Medicine, Antwerp, Belgium, ⁶Université Libre de Bruxelles, Ecole de Santé Publique, Brussels, Belgium and ⁷Université Catholique de Louvain, Institut de Recherche Santé et Société, Brussels, Belgium

*Correspondence author. Université Catholique de Louvain, Institut de Recherche santé et Société, Clos Chapelle-aux-Champs 30 boîte 3016, 1200 Brussels, Belgium. E-mail hedwig.deconinck@gmail.com

Accepted on 11 May 2016

Abstract

Since 2007 to address a high burden, integration of acute malnutrition has been promoted in Niger. This paper studies factors that influenced the integration process of acute malnutrition into the Niger national health system.

We used qualitative methods of observation, key informant interviews and focus group discussions at national level, two districts and nine communities selected through convenience sampling, as well as document review. A framework approach constructed around the problem, intervention, adoption system, health system characteristics and broad context guided the analysis. Data were recorded on paper, transcribed in a descriptive record, coded by themes deduced by building on the framework and triangulated for comprehensiveness.

Key facilitating factors identified were knowledge and recognition of the problem helped by accurate information; effectiveness of decentralized continuity of care; compatibility with goals, support and involvement of health actors; and leadership for aligning policies and partnerships and mobilizing resources within a favourable political context driven by multisectoral development goals. Key hindering factors identified were not fully understanding severity, causes and consequences of the problem; limited utilization and trust in health interventions; high workload, and health worker turnover and attrition; and high dependence on financial and technical support based on short-term emergency funding within a context of high demographic pressure.

The study uncovered influencing factors of integrating acute malnutrition into the national health system and their complex dynamics and relationships. It elicited the need for goal-oriented strategies and alignment of health actors to achieve sustainability, and systems thinking to understand pathways that foster integration. We recommend that context-specific learning of integrating acute malnutrition may expand to include causal modelling and scenario testing to inform strategy designs. The method may also be applied to monitor progress of integrating nutrition by the multisectoral nutrition plan to guide change.

Key words: Developing countries, health systems, integration, malnutrition

Key Messages

- A qualitative study identified factors that influenced the integration process of acute malnutrition interventions in Niger and offered insights on mechanisms that promoted or hindered integration.
- Factors that influenced integration most were information on the burden of acute malnutrition, recognition of the public health priority, leadership for policy adaptations and implementation, technical and financial resources, effectiveness of the intervention and capabilities and motivation of health actors.
- Results generated meaningful understanding on the integration process that may inform acute malnutrition intervention strategy designs for improved coverage and sustainability.

Introduction

The emergency response to Niger's 2005 food crisis triggered the introduction of a new approach to manage most children with acute malnutrition as outpatients in decentralized care. The demonstrated effectiveness and feasibility of the approach and the continuing high burden of acute malnutrition, which affects over 1 million children under 5 in Niger, prompted the Ministry of Public Health (MOH) to issue directives in 2007 to integrate acute malnutrition interventions into routine health care. This policy change came in response to concerns about government ownership and capacity for implementation. The policy called for delivery of integrated management of acute malnutrition (IMAM) in all public health facilities. It allowed rapid geographical expansion and aimed at resolving access, quality and coverage issues. Partners were no longer direct implementers but continued to support management of acute malnutrition. Despite the countrywide decentralization of IMAM, less than one-third of children with acute malnutrition were admitted for treatment in 2013 (United Nations Children's Fund 2013). As in most low-income countries, Niger's health system faces important operational capacity and resource challenges to delivering IMAM services.

With continuing high caseloads, the MOH and partners in Niger questioned how to better integrate IMAM for improved quality and coverage. To answer this question in the absence of an integration strategy for IMAM, we studied the extent of influences on the natural process of integration of acute malnutrition interventions into the national health system in Niger. Understanding pathways for integrating IMAM may inform ways to foster integration. The extent and trend of integration of IMAM into health system functions have been described in another article (Deconinck *et al.* 2016). The effect of integration on quality, coverage and sustainability was not studied. One systematic review studied integration of community worker programmes into health systems in low- and middle-income countries, but no study has been published on the integration of acute malnutrition interventions (Zulu *et al.* 2014). This article aims to enrich the debate on integration and inform strategic planning of IMAM in Niger and other low-income countries that are integrating or intend to integrate acute malnutrition interventions.

Methods

The study applied a qualitative approach to study factors that influenced the integration of IMAM using a document review; key informant interviews and focus group discussions at national, district and community levels; and observation of service delivery. Assessments were based on a framework (Atun *et al.* 2010a) of recurring themes that influenced integration by examining (1) the problem of acute malnutrition, (2) features of the IMAM interventions, (3) characteristics of the adoption system, (4) health system characteristics and (5) the broad context. The framework was

underpinned by the concept of diffusion of innovations (Rogers 2003; Greenhalgh *et al.* 2004). The framework encouraged systems thinking by examining the interaction of factors within and between the five components and any synergistic effects that affected or shaped integration. We defined 'integration' from a health system perspective as the extent, pattern and rate of adoption and eventual assimilation of a package of acute malnutrition interventions into the key functions of the health system in Niger (Atun *et al.* 2010a). Integrated care of the child with acute malnutrition and other illness resulting from activities at multiple levels of systemic, organizational, professional, clinical, functional and normative integration was central to our study, but generalized from a macro level perspective for the country (Goodwin 2013).

In 2013, Save the Children commissioned a review of IMAM in Aguié Health District in Maradi Region, Matameye Health District in Zinder Region and Niger overall. The two regions and health districts were selected based on convenience sampling (security of travel and representativeness). Data collection involved semi-structured key informant interviews with government administrators and partners, health managers, health workers, service users and community members (n: 57) and focus group discussions (n: 5) with community volunteers to gain insight into their experience, understanding and views. Level-adapted questionnaires with open-ended questions were based on existing frameworks for identifying barriers in the management of acute malnutrition (Deconinck *et al.* 2015). Second, service delivery and organizational management (behaviours and interactions among health care providers and service users) were observed in one regional and four district hospitals, five health centres, three health posts and nine communities purposively selected for maximum variation of performance, distance from the district health office and rural and urban settings. Third, policies, implementation strategies, guidelines and annual national, regional and district action plans were reviewed. National, regional and district databases provided quantitative data on the planning and service delivery performance. Fourth, an IMAM review workshop organized by the MOH in 2014 for 70 key health actors to make realistic operational recommendations for improved management of acute malnutrition contributed to the understanding of the integration process. Data from observations, interviews and focus group discussion were transcribed daily in a spreadsheet. Themes of integration factors were coded using a deductive approach by building on the conceptual framework. Data were synthesized and rearranged by themes, and reviewed by two authors (H.D. and A.P.). Data were triangulated for comprehensiveness and shared with key health actors.

Results

The analysis provided insights into the complex causal mechanisms that promote or hinder integration of acute malnutrition interventions into the national health system.

Broad context

Niger ranks lowest of the 187 countries in the 2014 Human Development Index, with 40.8% of its population living below the poverty line of USD 1.25 a day (United Nations Development Programme 2014). At the time of the study, seasonal migration for income generation was common. Recurrent drought, a fast-growing population and increasing urbanization has left the population with a permanent deficit of dietary diversity. A collapse in the livestock market and increased herding of livestock far from the home communities due to climate change had decreased children's access to milk. Adult literacy was 28.7% (United Nations Development Programme 2014). In 2011 one-half of all Nigeriens lacked access to clean drinking water, and nine out of 10 did not use improved sanitation facilities. Recent discovery of important mineral resources had increased neither the purchasing power of the population nor government expenditures on health and education. Persistent regional political instability and insecurity threatened development. The most severe emergency was demographic. Niger had the highest fertility rate in the world, at 7.6 in 2012, and its rapidly growing population put enormous pressure on resources, services and systems (République du Niger—Institut national de la statistique 2013b). Increasing urbanization, inadequate health budgets and population pressure further widened the capacity gap for health service improvement.

Niger signed the Millennium Development Goals in 2000, but only a change in government in 2007 enabled initiatives and partnerships for poverty reduction, increasing attention to undernutrition. Monitoring of the progress of comprehensive child survival interventions boosted information and communication on malnutrition status and management. One policy maker said, 'The change in political opinion in 2007 was a start for us to involve in addressing acute malnutrition'. In 2011, under the leadership of the President, multisectoral initiatives including the United Nations (UN)-led Renewed Efforts Against Child Hunger (REACH) and Scaling Up Nutrition (SUN) were brought under the innovative *Initiative des 3 N: Les Nigériens Nourrissent les Nigériens* (I3N). I3N focused on agricultural production, food security and livelihood interventions, including social protection for vulnerable populations, with the additional intention of controlling stunting and acute malnutrition. The political environment of agricultural development for improved food security supported other promotive and preventive health and nutrition initiatives. I3N and SUN, with their high profile champions, stimulated multisectoral nutrition actions and capacity development, including preparedness for contingencies. The multisectoral nutrition approach competed with food insecurity priorities, masking health system capacity needs for improved adoption of acute malnutrition, but also favoured curative over preventive aspects of acute malnutrition because of its immediate contribution to child survival and visibility.

Problem

In 2013, the prevalence of overall acute malnutrition in children 6–59 months (defined by weight-for-height below -2 SDs in the WHO child growth standards or the presence of nutritional oedema) was 13.3%, and the prevalence of severe acute malnutrition (SAM) (defined by weight-for-height below -3 SDs or the presence of nutritional oedema) was 2.6% (République du Niger—Institut national de la statistique 2013). SAM levels were higher among children 6–23 months (4.9%) than among children 24–59 months (1.3%) because of their vulnerability to common childhood diseases, early weaning and inappropriate complementary foods. Malaria, SAM

incidence and rainfall coincided during the pre-harvest season (Burki 2013), exacerbating vulnerability to illness. Although child mortality rates fell dramatically from 218 deaths per 1000 live births in 2005 to 114 deaths in 2012 and coverage of curative and preventive interventions increased, acute malnutrition persisted (McDonald *et al.* 2013). The decline in child mortality coincided with increased coverage of immunization, bed net use, exclusive breastfeeding and treatment of pneumonia, diarrhoea and acute malnutrition (Save the Children Niger 2013). Bi-annual monitoring showed overall acute malnutrition rates oscillating around WHO emergency levels since 2005. In 2013, about one of four children under 5 was diagnosed with and treated for acute malnutrition, amounting to 520 000 children with moderate acute malnutrition (MAM), and 400 000 children with SAM (United Nations Children's Fund 2013).

Acute malnutrition in children under 5 had always been a normal epidemiological picture rather than perceived as illness in Niger. A community member asked whether thinness in children was considered a health problem said, 'Young children are usually thin and often ill, especially before the harvest'.

The initial failure of politicians and health actors to understand the nutrition emergency during the drought in 2005 created pressure for humanitarian action (Olivier de Sardan 2007a). An influx of international agencies filled the national capacity void and improved information revealed the severity of malnutrition. Challenges in coordinating and regulating all these health actors encouraged government ownership and resulted in the policy change to integrate acute malnutrition interventions into all public health facilities.

Limited understanding of the causes and consequences of acute malnutrition, as well as poor treatment options and capacity, meant that acute malnutrition was initially inadequately addressed. Moreover, the seasonal concurrence of malaria and other childhood illnesses may have masked the peak acute malnutrition incidence, hence its severity. Long-term socio-economic consequences of impaired cognitive development and increased risk of chronic illness were underrated. Public awareness and political attitudes were stimulated by gradually expanding nutrition surveillance systems showing the effectiveness of decentralized care and the feasibility of implementing it at scale. Community awareness and health worker knowledge and practices were strengthened by increased information exposure and involvement in service delivery. But missing evidence and/or failure to reduce acute malnutrition incidence, combined with continuously expanding child cohorts fuelled by the demographic boom, resulted in persistently high caseloads that discouraged health actor.

Intervention

Acute malnutrition interventions introduced new processes that affected health actors at all levels. The new approach promoted the following policy changes. Early community detection of malnourished children, awareness raising and mobilizing communities generated demand and involvement. In facility-based primary care, children with uncomplicated SAM or MAM were diagnosed daily, treated with antibiotics, given therapeutic or supplementary foods to take home and scheduled for weekly or bi-weekly follow-up visits until they were cured. District and referral hospitals provided care for children with SAM and medical complications until their condition was stable and appetite returned. They then continued weekly outpatient treatment in primary care closer to their homes. Group and individual counselling on feeding during and after illness was part of the treatment. Children were referred and counter-referred between levels of care and their homes and received home visits

depending on their health condition and progress. Families were linked with social protection networks to prevent relapse. Quarterly vaccination outreach and national child health days for vitamin A supplementation and deworming included case finding and referral of ill children.

IMAM was provided in over 1000 health facilities in Niger in 2013. Health centres allocated *centres de récupération nutritionnelle ambulatoire sévère*, or CRENAS, for SAM, and *centres de récupération nutritionnelle ambulatoire modérée*, or CRENAM, for MAM. Most hospitals allocated buildings or wards [*centres de réhabilitation nutritionnel intensif* (CRENI)] allocated for SAM with complications. Partners supported rehabilitation or construction of waiting, treatment, storage and play areas for acute malnutrition that often contrasted starkly with paediatric wards.

Health workers required new skills to screen and diagnose acute malnutrition based on anthropometry and clinical signs, triage for referral based on SAM-specific danger signs and appetite test results, initiate and monitor treatment based on weight, keep SAM-specific medical records and do weekly and monthly reporting. Community volunteers required new skills for case finding and counselling. District and facility managers needed to coordinate new activities, budgets and supplies; supervise and support health workers; and monitor service quality. A complex parallel system was established to address government capacity gaps in forecasting, procuring, distributing and monitoring use of bulky and costly supplies. The complexity of acute malnutrition interventions, described below, slowed integration (Atun *et al.* 2010a):

Multiple episodes of care and multiple elements of intervention:

Early case finding in the community, with increased surge during lean periods or environmental shocks; multiple diagnosis and treatment steps, with co-morbidities managed weekly over 2 months with short-term inpatient care in case of complications

Multiple levels of care and multiple health actors: Preventive and curative secondary and primary care in health facilities and communities involving multidisciplinary health workers from various institutions and backgrounds

High user engagement in care with both technology and behaviour changes: Carers' responsibility to continue treatment at home and adapt care and feeding practices; and health workers' adaptation to novel diagnostic procedures, treatment protocols and medical products and reporting.

The following attributes of acute malnutrition interventions facilitated integration (Rogers 2003):

Relative advantage: Case finding and effective decentralized primary care services resulted in high caseloads and work overload, but reduced need for more difficult and costly hospital care. IMAM empowered health workers, and therefore districts, to treat children successfully and decrease case fatality, and community engagement generated demand and involvement. Health workers appreciated being able to treat the condition early and avoid hospitalisation, which gained them respect from service users. A health worker in a health centre expressed his satisfaction, 'Mothers don't want to go to the hospital with their sick children. It is so much better to be able to treat children here before they become very ill'.

Compatibility: Clinical care of acute malnutrition was perceived as 'rather' compatible with integrated management of childhood illness (IMCI) and child survival interventions despite lengthy diagnostic procedures and treatment protocols. Some new activities tended to be left to volunteers supported by partners (e.g. anthropometry, registration, reporting). Regional and district health management teams lacked funds, skills and time to

manage all operational changes. They counted on partners to cover budget gaps, forecast supply needs, procure and distribute supplies, conduct population assessments and manage community-based interventions. As one health worker said, 'Partners do the community activities for acute malnutrition well because they have more means than us to do these. We already take care of outreach during the child health days.' Incompatibility with existing activities delayed involvement and uncovered resources and competency gaps. Therefore, there was not much objection to parallel activities provided by partners.

Trialability: Emergency nutrition responses with vast resources created implementation and learning opportunities. District capacity to organize activities was strengthened. Expanded clinical care for saving lives was prioritized at the expense of system strengthening for sustainable change. High health worker mobility led trained providers to take their skills elsewhere. One health centre nurse said, 'Before being posted here I was working in another district where there was a major malnutrition centre where I learned good skills.'

Observability: Decentralised care, combined with active case detection, created opportunities for learning and dramatically improved effectiveness and coverage. Rapid response of acutely malnourished children to treatment generated the respect of carers and communities. Countrywide scale-up with positive performance results encouraged local authorities and health actors.

Adoption system

The study explored the perceptions of key health actors who as individuals or institutions, with varied interests, values and power distributions facilitated or resisted the integration of IMAM. Individuals included politicians, donors, decision makers, planners, managers, care providers and other allied health professions, volunteers, researchers, educators and trainers, community members, religious leaders, traditional healers, households and patients or service users. Institutions included the government, UN agencies, non-governmental organizations, faith-based and private organizations, academia, professional associations, community groups and local authorities, representing the formal, private and informal health sectors. Their engagement in IMAM integration varied between the extremes of supporting, abstaining or blocking. Perception of various health actors in IMAM integration encompassed both benefits and risks.

Perceptions of policy makers and health managers

Benefits. IMAM helped achieve goals of reducing child mortality and poverty, providing concrete results, even if there was no direct impact on incidence. Saving children's lives was emotional and eye catching. Continued international donor and partner leadership and technical and financial support compensated for national capacity gaps. The decision of the MOH to integrate IMAM directed resources toward strengthening national capacities.

Risks. Short-term and parallel emergency funding through bilateral agreements between donors and UN or civil society partners bypassed government management and capacity strengthening and undermined ownership. IMAM components were not always regulated, aligned or linked. There were no organigrams or job aids to clarify roles and track accountability. Workload was high, and staff turnover and attrition left knowledge and capacity voids. Information was shared in occasional coordination meetings or supervision visits, but problem solving and learning were limited. Fragmented and diverse interests and mandates hindered

collaboration, which was demotivating and shifted responsibilities to partners. District managers and partners developed a collaborative but intricate relationship, balancing shifted and supported tasks. One health manager said, 'We have a very good relationship with the partners. When we run out of supplies, we call them and they help us out. We can count on them.'

Perceptions of communities and local authorities

Benefits. IMAM was an effective problem solver for the high burden of acute malnutrition. Ill children rapidly improved, and their carers were the best advocates. Improved care increased trust in the health services. IMAM generated jobs, incentivized community volunteers, increased local capacities and involvement and reached out to vulnerable populations and remote communities. In some cases, IMAM strengthened weak community health management. Engaging with religious leaders, traditional healers and community members stimulated interest and involvement.

Risks. Communities had limited involvement in planning, implementing, monitoring or financing interventions. Community-appointed volunteers needed strong and continual partner supervision to remain active and effective. Community IMAM interventions were considered the work of non-governmental organizations. In areas without partners, community engagement was limited to occasional child survival health outreach. Despite decentralized health care, many vulnerable groups incurred high opportunity costs to reach health facilities. Many communities and local authorities remained unaware of the acute malnutrition problem and the availability of IMAM services. Religious leaders and traditional healers remained preferred first-line providers, obstructing or delaying access to treatment.

Perceptions of service providers

Benefits. IMAM offered treatment for a previously ignored problem. Decentralized care and early detection simplified treatment and improved survival, hence client and provider satisfaction. Multiple training opportunities improved skills and quality of care, boosting confidence and motivation and creating career development opportunities. Partners dealt with bottlenecks in supply management, reporting, training, supervision and cost recovery.

Risks. High caseloads of acute malnutrition, weak organizational skills and work in isolation affected the performance of health services that already suffered from staff shortages and high turnover. Sharing or shifting tasks to partners and volunteers encouraged evasion of responsibility, furthering a downward spiral of motivation. One health worker said, 'Acute malnutrition is not our problem; it is the problem of the non-governmental organization.' Delegating acute malnutrition tasks to specific health workers prevented rotation of duties and affected motivation. Competition within the health sector and among partner organizations stimulated attrition and changes in assignments.

Health system characteristics

The study explored the compatibility of acute malnutrition interventions with the six WHO domains of governance, health financing, health information, health workforce, medical products and service delivery (World Health Organization 2007).

Governance

The MOH and partners elaborated policies and plans that contributed to improved child survival, driven by Niger's 2006 policy on free health care for children under 5 and 2008 policy on expanding health posts with community health workers. The latest updates of these policies covered acute malnutrition interventions as part of a basic package of child health services. Separate national IMAM guidelines were periodically updated and disseminated to harmonize actions. The new national accelerated child survival and development strategy further decentralized integrated management of childhood illness (IMCI) to health posts, including elements of management of acute malnutrition. Advocacy efforts to scale up nutrition interventions, including for acute malnutrition, increased with multiple multisectoral national initiatives. However, translating and operationalizing sectoral action planning remained challenging. High turnover of policy makers and managers hampered institutional learning and fragmented accountability. Aligning about 20 partners at national, regional, and local government and community levels was challenging, with their diverse geographic coverage, mandates, expertise, working modalities and funding cycles. Small projects with different objectives and funding cycles turned over quickly and were often plagued by funding interruptions. Two national workshops on improved IMAM involving key national and regional health actors discussed a road map that was not translated into actions or policy changes. Health actors were used to cherry picking activities according to their institutional mandates, interests, comparative advantage, capacity and donor interest, not necessarily the priorities in the agreed action plan. A recent initiative to align partners is a step toward improved strategic and systemic planning.

Health financing

There was no pooling of funds or specific national budget allocation for IMAM under maternal and child health services. Most IMAM funding was channelled through external vertical financing systems. Nonetheless, as IMAM was considered an integrated health service, government health budgets covered supervision, staffing and monitoring. Annual health action plans did not include specific costed activities for IMAM or in-kind support for IMAM covered by partners. The MOH therefore could not trace IMAM activities that were costed or unaccounted for or that received external or extra-budgetary support. Moreover, the financial planning cycles of MOH and partners were not aligned. Delayed reimbursement of fee exemptions affected all service delivery, including IMAM. Government discussed ways to solve the bottlenecks, but out-of-pocket payment for medications and laboratory tests for ill children were common. Sometimes partners compensated fee payments to assure free health care for children under 5 as per the national policy. In 2014 one region covered part of its specialized therapeutic food needs with its own health budget, but this may have been at the cost of another priority intervention.

Health information

After the 2005 crisis, the National Institute of Statistics, MOH and partners developed an elaborate health and nutrition surveillance system, which included acute malnutrition indicators. Three health facility-based surveillance systems reported on acute malnutrition independently. The weekly Notifiable Diseases Surveillance system reported on newly detected cases and deaths from illnesses including acute malnutrition. The weekly Scaling Up system reported on newly admitted acute malnutrition cases and deaths, as well as use

of supplies. A monthly performance monitoring system provided detailed admission and end-of-treatment information. Another information system piloted instant short messaging to improve accuracy and real-time reporting on therapeutic and supplementary food. These parallel systems reported on the same phenomenon using the same primary data but different indicators, measured mostly by volunteers and recorded by health facility managers, and yielded different results. Primary data were entered and re-entered, used and re-used, amalgamated and disaggregated numerous times. Data audits and information improvement systems did not increase accuracy, and the precision of the primary data and recording systems were unknown. There was no open access to national repositories, and instant information feedback was limited. Partners maintained their own information systems for different project areas and funding cycles and conducted their population-based nutrition and coverage assessments.

Niger was often cited as a research laboratory for acute malnutrition. The country teemed with international operations research projects, but few national health actors were involved or informed of the results. New national evidence and learning fed global rather than national actors, hampering translation of knowledge actions or policy changes.

Health workforce

In 2008 Niger had an average of 39.4 skilled health workers per 100 000 population (World Health Organization 2002), six times fewer than the WHO minimum recommendation (World Health Organization 2006). The community health workers that provided basic and preventive care in health posts since the 2006 policy had expanded to over 2500. Major recruitment in 2013 tripled the number of physicians and nurses, and another recruitment was being planned. In addition, partners supported the MOH to contract over 2000 IMAM-specific health workers, unbalancing staff coverage in secondary and primary care. Nonetheless, health facilities continued to suffer from staff shortages because rapid population growth and staff attrition in rural and remote areas increased workload. The system functioned as long as it was supported. Task sharing for acute malnutrition among health actors and task shifting to volunteers or partner-employed assistants were common. Staff motivation and accountability were low in a system without job descriptions, performance appraisal or health insurance. Short workdays hinted at opportunistic side activities. For community-based primary care, community liaison workers ('relais communautaires') were not yet formally activated and supported. Meanwhile, partners organized, trained, supervised and incentivized community-appointed volunteers to cover preventive community-based primary care.

Teams of master trainers helped regional and district health teams train health workers in IMAM when resources were available. Most IMAM staff received one inception and one refresher training. High staff turnover meant thin coverage of competencies, as IMAM was not covered in professional pre-service education adequately. Quarterly supportive supervision, with transport supported by partners, provided some problem solving opportunities. Numerous training courses offered by various programmes led to absenteeism that negatively affected quality of care. Poor health facility infrastructure could not always accommodate new technical skills that could not be translated into improved responsibilities.

Medical products

Drug and supply management were subject to cost recovery. District hospitals and health centres accessed drugs from communal pharmacies that were part of the national pharmacy. Regional

hospitals accessed drugs directly from regional dispatch centres. Drug stock outs often necessitated out-of-pocket payment. Because of the bulk and expense of IMAM supplies, partners delivered drugs and therapeutic foods to regional health directorate warehouses and supported regions to transport them to health districts. The health districts were then expected to deliver the supplies to health facilities. Sometimes community health management committees hired transport to supply health facilities. In reality, partners stepped in to deliver drugs and specialized food products. Some partners had their own supplies and delivery channels. Some delivered all routine IMAM supplies to health facilities in their support areas, and the facilities reported needs directly to the partners. Different parallel supply channels for IMAM formed a complex and uncoordinated network, bypassing national, regional and district systems. Forecasting of supply needs was weak, resulting in frequent stock outs.

Service delivery

The IMCI approach of providing comprehensive continuity of care for child illnesses facilitated adoption of acute malnutrition interventions, but operationalization varied from site to site. Daily admissions and follow-up of children with acute malnutrition successfully spread the added acute malnutrition burden and stimulated continuity of care. All 44 hospitals provided inpatient SAM care, mostly in special wards with dedicated staff. Over 1000 health centres (and health posts with nurses) provided weekly outpatient management of SAM aided by volunteers. Outpatient management of MAM was provided mostly at health facilities, aided by volunteers often organized in parallel circuits, with services frequently disrupted by supply stock outs. Referral and tracking of children with acute malnutrition were weak. Quarterly health outreach visits and campaigns for prevention of child illnesses included routine case finding and referral of common child illness, including acute malnutrition that was also supported by partners. Community screening was done by volunteers supported by partners; self-screening by carers was piloted and had promising results. Routine screening in health facilities depended on health worker skill and motivation. Despite community health initiatives and management committees, the MOH was minimally engaged in community health, and partners filled the gaps.

Summary

Mechanisms that promoted and hindered the integration of acute malnutrition into the national health system, as well as missed opportunities identified by interviewees are listed in Table 1.

Key factors that facilitated the integration of IMAM were:

- Broad context: political readiness, interest, and support and progress monitoring for resilience and development initiatives
- Nature of the problem: knowledge of causes and consequences of illness and prevention and treatment pathways, accurate information on the burden of disease, and political and social environment to recognize the problem and initiate change
- Intervention: skill development; decentralised care increasing exposure, access, utilization and involvement; quality of care showing effectiveness and increasing awareness and user satisfaction; and clinical, organizational and management capacities in successful sites
- Adoption system: compatibility with personal, professional and institutional goals, values and principles; collaborative support, engagement and involvement; learning and career development opportunities; and support for problem solving

Table 1. Mechanisms promoting or hindering integration of acute malnutrition interventions into the national health system in Niger, and missed opportunities

Component	Mechanisms promoting integration	Mechanisms hindering integration	Missed opportunities to improve integration
Problem	<ul style="list-style-type: none"> Increasing knowledge of causes and consequences of illness, prevention and effective treatment pathways Increasing availability of accurate information Creating opportunities for advocacy to raise awareness of the problem and initiate change 	<ul style="list-style-type: none"> Using incomplete or inaccurate information on the burden of disease Not having evidence and capacities to impact incidence 	<ul style="list-style-type: none"> Recognizing the burden on the health system and long-term socio-economic consequences
Intervention	<ul style="list-style-type: none"> Learning from good practices and involvement in implementation Decentralizing quality care that shows effectiveness and increases exposure, awareness, access, utilization and involvement Expanding clinical skills and operational and management capacities at various levels Receiving financial and technical support from partners 	<ul style="list-style-type: none"> Not institutionalizing clinical, operational and managerial capacities hence encouraging partners supporting or substituting interventions in parallel ways Separating and naming service delivery sites as specialised 'centres' Not addressing weak community awareness and involvement 	<ul style="list-style-type: none"> Aligning (and simplifying) diagnostic, treatment and follow-up protocols as part of IMCI Empowering communities and patients/carers to do case finding and treatment Empowering health workers through continuous quality improvement
Adoption system	<ul style="list-style-type: none"> Strengthening capacities and opportunities for involvement and collaboration Engaging health actors in design, planning, implementation and monitoring Experiencing social recognition and user satisfaction Creating opportunities for learning, job satisfaction and career development Creating a support system for problem solving 	<ul style="list-style-type: none"> Not aligning personal interests Not aligning fragmented or competing institutional mandates and working modalities Not addressing increased workload Not addressing high turnover and attrition Accepting partner support that risk unbalancing health priorities 	<ul style="list-style-type: none"> Reducing isolation and encouraging involvement by creating peer networks and platforms for information sharing and participatory problem solving Engaging missing partners, e.g., academic and training institutions and professional associations
Health system	<ul style="list-style-type: none"> Enacting policies on, e.g. free healthcare, expanded community health workers, decentralization of care Coordinating and regulating health actors Sharing real-time information for planning and learning Monitoring and evaluating quality of care Assessing coverage of services and barriers to their access and use Expanding health cadres Decentralizing health care Establishing master trainer teams for continuing professional development Producing ready-to-use therapeutic food locally Connecting communities with health facilities through community volunteers 	<ul style="list-style-type: none"> Underfunding health care Relying on short-term un-pooled bilateral emergency funds as the primary funding source Delaying reimbursement of exemption fee Maintaining numerous parallel information systems Not providing health and allied professions with pre-service knowledge and skills Understaffing health care characterised by high turnover and attrition Maintaining a parallel supply system Positioning health workers in specialised positions without rotation Not providing career development Not strengthening logistics and funding for bulky, expensive supplies Not involving and empowering communities and creating trust 	<ul style="list-style-type: none"> Setting priorities and planning strategically with a systems approach Expanding partnerships to include training institutions and professional associations Contracting competent partners for specific interventions Channelling external funds into pooled health funds Connecting health actors through peer networks Establishing an open-access information platform Unlocking community capacities for involvement, demand generation and behaviour change Improving referrals and tracking of patients with mental health Organizing single data entry for monitoring and evaluation using innovative information and communication technology to feed into the national health information system
Broad context	<ul style="list-style-type: none"> Stimulating political readiness, interest and support Building political stability for development Increasing resilience to environmental shocks Monitoring progress for achieving the Millennium Development Goals and other multisectoral initiatives 	<ul style="list-style-type: none"> Ignoring demographic pressure Loosing focus on sectoral improvements by prioritizing multisectoral vision 	<ul style="list-style-type: none"> Unlocking national capacities for improved planning for development and resilience

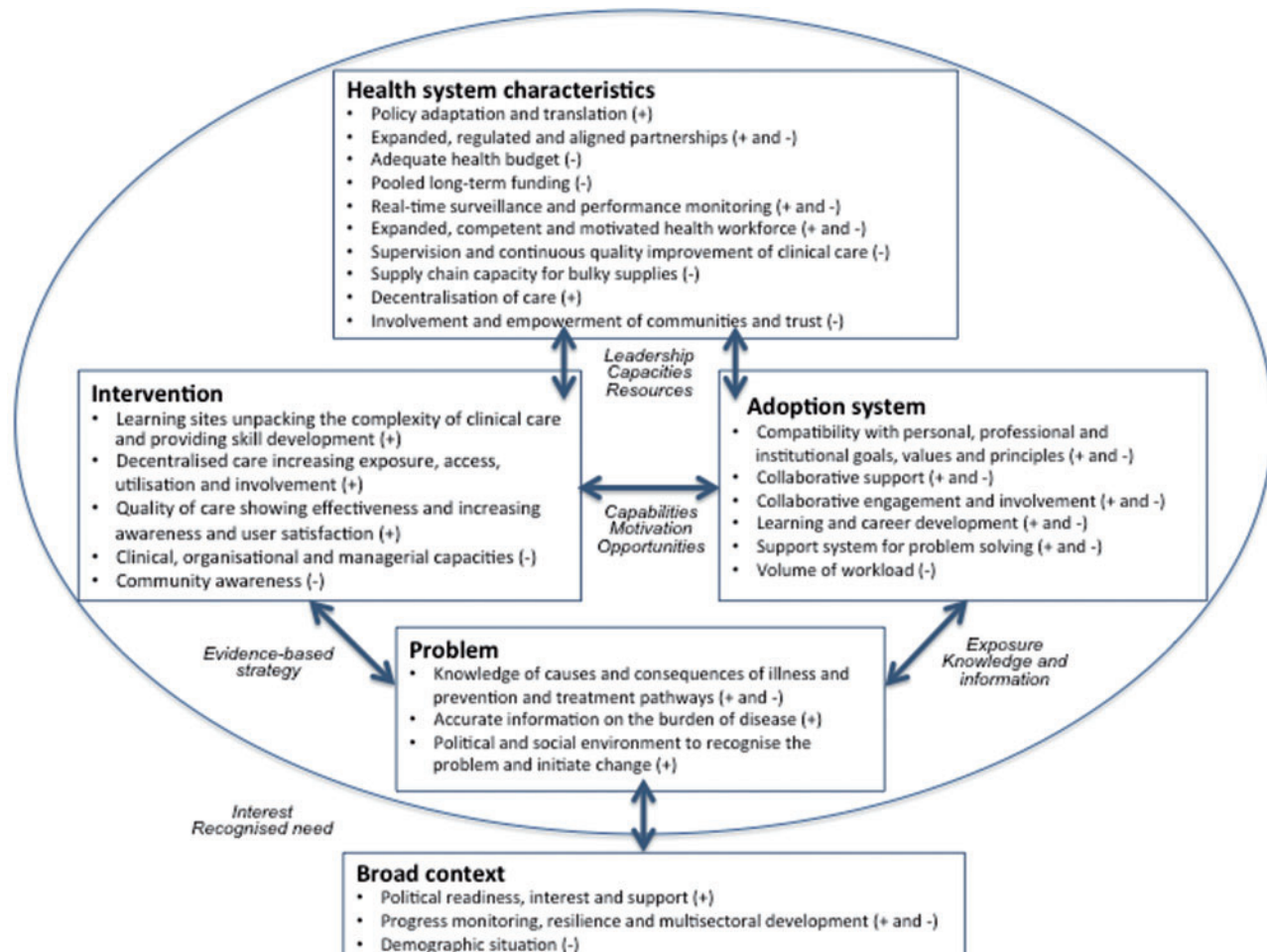


Figure 1. Factors influencing the integration process of acute malnutrition interventions into the national health system in Niger. Promoting factors are marked (+), hindering factors (-), both promoting and hindering factors (+ and -).

- Health system characteristics: policy adaptation and translation; expanded, regulated and aligned partnerships; expanded health workforce; and decentralised care

Key factors that hindered the integration of IMAM were:

- Broad context: demographic pressure and multisectoral approach diverting a sectoral focus
- Nature of the problem: missing evidence
- Intervention: clinical, organizational and management capacity gaps in certain sites, interventions substituted by partners and limited community awareness and involvement reinforcing mistrust
- Adoption system: partner support favouring evading responsibility; lack of interest or motivation or collaboration in care and learning, feeling of curtailed career development, and high workload
- Health system characteristics: multiple health information systems; underfunded health budget; short-term emergency funding; high staff turnover and attrition; limited logistic capacity for bulky, expensive supplies; and limited community and patient/carer involvement and empowerment

Figure 1 summarizes key factors and interactions that affected integration, with + indicating promoting factors and - indicating hindering factors. Factors that promoted integration in some contexts and hindered it in others are marked by both + and -.

Factors interacted and positively or negatively balanced or reinforced their influence on the integration process. For example, perceived poor quality of care undermined motivation, and poor motivation decreased quality of care; both hindered integration. Some health workers embraced task shifting to avoid work, while others embraced it to improve quality of care. Specialization motivated those with limited skills but discouraged others. Some factors both promoted and hindered integration. For example, partner support strengthened the capacity of district health managers but hindered their capacity to deliver supplies to health facilities. In Niger, health workers in rural and remote areas had similar working conditions, exposure to training and access to resources, but some sites organized and mainstreamed continuity of care while others provided services in a parallel system. Health workers seemed to look for challenges and maintained their curiosity. From an intervention perspective, the key to successful integration was evidence-based strategy; from a health system perspective, it was leadership, capacities and resources; from an adoption system perspective, it was knowledge, capabilities, motivation and opportunities to provide quality interventions; and from the broader context perspective, it was political interest and recognized need.

Discussion

The study provided insights into factors that influenced the integration of acute malnutrition into the national health services system in

Niger. Integration was stimulated by calling management of acute malnutrition 'integrated' from 2007, but it was hindered by the lack of a clear strategy. Forces that stimulated the integration of IMAM, driven by the emergency context, were health policy changes; MOH ownership; expectations that integration would improve quality, coverage and sustainability; and multisectoral interest in improving nutrition security.

Partners played an important role in the introduction and spread of the innovative management of acute malnutrition in Niger during the emergency situation, when the need was high. The urgency led to a parallel system, but the actions readied the system for innovation and created an environment for health actors to be receptive to change. Some partners purveyed knowledge because of their experience in pilots in and outside the country. Others were early adopters or change agents, with the stimulus of emergency donors. However, diffused leadership at the start of the IMAM introduction was unable to define a strategic plan and align partners. The disorderliness that followed prompted the MOH to call for integration to take ownership. The IMAM innovation therefore spread by diffusion rather than dissemination without a designed strategy and defined goal (Greenhalgh *et al.* 2004). The lack of a clear strategy may have diluted or duplicated efforts and led to missed opportunities. The support, neutrality or opposition of actors involved with IMAM was difficult to define, as they took different positions for different aspects and in different degrees (Varvasovszky and Brugha 2000). At least all financial and technical partner support aimed to increase MOH ownership and help achieve sustainable services.

Integration of the management of acute malnutrition was initially interpreted as care provided in government health facilities. The meaning gradually shifted toward the WHO definition of 'integrated care' as 'a continuum of preventive and curative services according to patient needs over time and across different levels of the health system' (Briggs *et al.* 2001). But changes were required not only in service delivery but also in regulations, organization, functions, financing, services, clinical care and relations, with shared values and commitment across implementation levels and health actors (Atun *et al.* 2011). Health actors in Niger understood the need for changes but did not formally plan for them, because integration was considered to have been achieved.

Health actors in Niger believed that integrating a health intervention into routine health services were desirable to improve efficiency, cost-effectiveness, client orientation, equity, local ownership, quality of services hence health outcome. However, systematic reviews of integration of primary care services in low-income countries could not draw conclusions about its benefits and disadvantages (Briggs *et al.* 2001; Atun *et al.* 2010b; Dudley and Garner 2011). In Niger, health actors did not question the desirability, feasibility or appropriateness of integration or reflect on the benefits and risks of integrated acute malnutrition interventions. Integration may have extended coverage and increased health system capacity; and it may have robbed IMAM of the privileged status necessary to nurture it to maturity and balanced health care (Criel *et al.* 2004).

Multisectoral national initiatives put nutrition in the limelight and boosted strategic and collaborative systemic planning to address the causes of acute malnutrition and rebalance promotive and preventive nutrition (Black *et al.* 2013). The multisectoral nutrition plan engaged sectoral ministries, this involvement risked losing a sectoral focus on system strengthening for 'improved sustainability. Moreover, health actors continued to evaluate progress and develop action plans in a linear way. Resulting road maps missed the opportunity to address dysfunction in the multisectoral nutrition system and did not consider factors that interact and create synergies that

can reinforce, balance or hinder integration, thus missing the opportunity to plan for sustainable changes. Health actors did not view integration as a process that needs goal setting and continuous adaptation to the changing context, nor did they recognize that not all integration is desirable or needed.

This study had a number of limitations and lessons for improving design for similar studies of integration of acute malnutrition interventions. First, convenience sampling of two districts in a country with about 46 health districts in nine regions probably did not capture all learning. Second, data collection methods were adapted to the security context and time availability. Paper questionnaires rather than audio recording hampered verbatim reporting and computer-assisted analysis of interviews. Third, a deeper analysis of social interactions among actors interested in integration of IMAM would have improved understanding of ways to influence, monitor and engage health actors for change (Olivier de Sardan 2007b). Fourth, the study did not assess the financial sustainability of IMAM because this would require a different analytical method to consider the country's overall health and nutrition budgeting system largely supported by financial partners, which was beyond its scope. Fifth, findings were validated in an implementation rather than a research setting and may have suffered from information bias. Finally, the study took initial steps to apply a dynamic system tool to identify the effects of interactions, but causal modelling and scenario building with key health actors should be further explored.

Despite its shortcomings, this study provided insights into the complex causal mechanisms that promoted or hindered integration of acute malnutrition in Niger. The framework approach provided a systems lens that deepened understanding of how pathways for increasing integration can help sustain coverage of effective interventions. Learning from the case study findings may encourage causal mapping and scenario building, stimulate discussion of the need for and goal of integration, and as such, inform health system strengthening and strategy change for improved acute malnutrition outcomes. The method could also be applied to study and guide the sectoral integration of nutrition interventions of the multisectoral nutrition plan.

Conclusion

The framework approach provided a systems lens that deepened understanding of how pathways for increasing integration can help sustain coverage of effective interventions. Study findings indicated that Niger in many ways exceeded expectations in providing integrated acute malnutrition care in almost all hospitals and health centres, albeit with considerable external support and despite the lack of an integration strategy. The dynamic interaction of factors that influenced the integration process suggested non-linear processes that may have led to unpredictable outcomes or unintended consequences that were difficult to account for. As such, causal modelling and scenario testing for improving sustained coverage of effective IMAM by considering factors influencing integration merit further exploration. The results may encourage health actors in Niger and other low-income countries that are integrating acute malnutrition interventions into their national health systems to align partners with different objectives to work collaboratively toward the common goal of sustainably improving health outcomes.

Acknowledgements

This article is based on a review made possible by Save the Children Niger and participation in a national workshop supported by the Ministry of Public

Health of the Government of Niger, United Nations Children's Fund and European Commission Directorate-General for Humanitarian Aid and Civil Protection. Save the Children Niger supported the field visit and data collection.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Atun R, de Jongh T, Secci F, Ohiri K, Adeyi O. 2010a. Integration of targeted health interventions into health systems: a conceptual framework for analysis. *Health Policy and Planning* 25: 104–11.
- Atun R, de Jongh T, Secci F, Ohiri K, Adeyi O. 2010b. A systematic review of the evidence on integration of targeted health interventions into health systems. *Health Policy and Planning* 25: 1–14.
- Atun R, de Jongh TE, Secci FV *et al.* 2011. Integration of priority population, health and nutrition interventions into health systems: systematic review. *BMC Public Health* 11: 780.
- Black RE, Victora CG, Walker SP *et al.* 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet* 382: 427–51.
- Briggs CJ, Capdegelle P, Garner P. 2001. Strategies for integrating primary health services in middle- and low-income countries: effects on performance, costs and patient outcomes. *Cochrane Database Systematic Review* Cd003318.
- Burki TK. 2013. Malaria and malnutrition: Niger's twin crises. *The Lancet* 382: 587–8.
- Criel B, Kegels G, Van der Stuyft P. 2004. Editorial: a framework for analysing the relationship between disease control programmes and basic health care. *Tropical Medicine and International Health* 9: A1–4.
- Deconinck H, De Man J, Macq J. 2015. *Health systems strengthening for integrating and scaling up management of severe acute malnutrition. Report of a literature review.* Brussels: Université catholique de Louvain.
- Deconinck H, Hallarou M, Criel B, Donnen P, Macq J. 2016. Integrating acute malnutrition interventions into national health systems: lessons from Niger. *BMC Public Health* 16: 249.
- Dudley L, Garner P. 2011. Strategies for integrating primary health services in low- and middle-income countries at the point of delivery. *Cochrane Database of Systematic Review*, Cd003318.
- Goodwin N. 2013. Understanding integrated care: a complex process, a fundamental principle. *International Journal of Integrated Care* 13: e011.
- Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. 2004. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Quarterly* 82: 581–629.
- McDonald CM, Olofin I, Flaxman S *et al.* 2013. The effect of multiple anthropometric deficits on child mortality: meta-analysis of individual data in 10 prospective studies from developing countries. *The American Journal of Clinical Nutrition* 97: 896–901.
- Olivier de Sardan J-P. 2007a. Crise alimentaire et malnutrition infantile au Niger: le bilan de la «famine» de 2005. *Critique Internationale* 4: 37–49.
- Olivier de Sardan J-P. 2007b. De la nouvelle anthropologie du développement à la socio-anthropologie des espaces publics africains. *Revue Tiers Monde* 3: 543–52.
- République du Niger - Institut national de la statistique. 2013. Enquête démographique et de santé et à indicateurs multiples 2012 (EDNS-MICS IV) 2012. Niamey: INS.
- Rogers EM. 2003. *Diffusion of Innovations*, 5th edn. New York: Free Press.
- Save the Children Niger. 2013. *Lives on the line: An agenda for ending for ending preventable child deaths.* London: Save the Children.
- United Nations Children's Fund. 2013. *Scaling Up Week 52, 2013.* Niamey: UNICEF.
- United Nations Development Programme 2014. Human development report 2014. Sustaining human progress: Reducing vulnerabilities and building resilience. New York: United Nations Development Programme.
- Varvasovszky Z, Brugha R. 2000. A stakeholder analysis. *Health Policy and Planning* 15: 338–45.
- World Health Organization. 2002. *Global Health Observatory Data Repository.* WHO African region: Niger statistics summary (2002–present).
- World Health Organization. 2006. *The World Health Report 2006. Working Together for Health.* Geneva: WHO.
- World Health Organization. 2007. *Everybody's Business. Strengthening Health Systems to Improve Health Outcomes. WHO's Framework for Action.* Geneva: WHO.
- Zulu JM, Kinsman J, Michelo C, Hurtig A-K. 2014. Integrating national community-based health worker programmes into health systems: a systematic review identifying lessons learned from low-and middle-income countries. *BMC Public Health* 14: 987.