



AFRICA ROUTINE IMMUNIZATION SYSTEM ESSENTIALS

DRIVERS OF ROUTINE IMMUNIZATION SYSTEM PERFORMANCE AT THE DISTRICT LEVEL

CAMEROON CASE STUDY

ARISE Research Brief | Number 4

In sub-Saharan Africa¹, immunization coverage, expressed as the percentage of children who received the third dose of diphtheria-tetanus-pertussis vaccine (DTP3), has increased substantially in the past decade, rising from 55 percent in 2000 to 77 percent in 2010.² Yet, coverage gains vary across the region, and pockets of low vaccination coverage exist within countries among both rural and urban settings.

The foundation of successful national immunization programs is routine immunization (RI)—the provision to all children of consistent, timely protection from common childhood diseases through vaccination. Effective RI systems help to sustain the gains from vaccination campaigns and provide the structure for the introduction of new vaccines. The Africa Routine Immunization System Essentials (ARISE)³ project was created in late 2009 to learn from those countries whose immunization systems are performing well. The project aimed to consolidate experience and learn about what drives improvement in RI coverage in Africa as well as establish new evidence on how to diffuse and scale up effective strategies for improving RI coverage.

During the first stage of the project in 2010, ARISE interviewed implementers and technical and development partners and completed a systematic review of published and grey literature on the drivers of RI system performance in Africa (performance is defined for the purpose of this study as DTP3/Penta 3 coverage).⁴ A preliminary set of policies, procedures, and investments driving RI system performance emerged.⁵ To investigate these and other



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possible drivers of coverage improvement in-depth and to better understand how they work in practice, ARISE conducted a study of the drivers of RI performance in four districts in Cameroon. The research in Cameroon is part of a larger study that extends to Ethiopia and Ghana, as well. This research brief reports the results of the Cameroon case study.⁶

BACKGROUND

Nearly 20 million people live in Cameroon. Half of the population lives in cities and towns, and a large minority live in mountainous terrain or other regions that are isolated for parts of the year. According to United Nations Development Program's 2011 Human Development Index, Cameroon ranks 150th out of 187 countries but has a human development score (0.482) slightly above the regional average for sub-Saharan Africa (0.463).⁷ The World Health Organization (WHO) estimates average life expectancy at 51 years. Since 1990, the infant mortality rate estimates have ranged between 84 and 91 deaths per 1,000 births, and under-five child mortality rates were between 130 and 150. High rates of maternal mortality, low adoption of family planning, and an HIV prevalence rate of 5 percent in the adult population demonstrate the enormous health challenges.⁸ Major social, political, and economic events as well as immunization policies shaped the historical trend in vaccination coverage (Figure 1). Key actions are detailed in the policy timeline (Box 1).

The rapid expansion of the Expanded Programme on Immunization (EPI) in the 1980s paralleled a national commitment to primary health care and a decentralized administrative system. A devastating economic crisis in the late 1980s and the subsequent structural adjustment program had an immediate effect on reducing coverage. Initiatives introduced in the late 1990s enabled the

Box 1. CHRONOLOGY OF KEY HEALTH SYSTEM EVENTS, 1983–2010

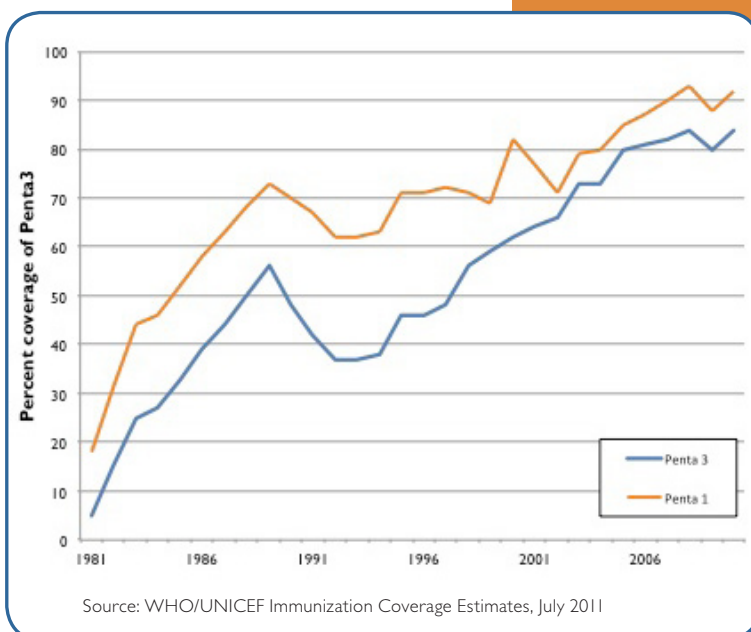
1983:	National Primary Health Care Policy
1985:	Universal Child Immunization (UCI) begins
1987:	Bamako Initiative
1987:	PHC policy focus on infrastructure
1990:	UCI ends
1995:	Decree creating health districts
1998:	Creation of community management structures
2000:	Entry to HPIC (Highly Indebted Poor Countries Initiative)
2001:	Data quality audit
2001:	Health Sector Strategy (2001–2010)
2001:	Comprehensive Multi-Year Plan (cMYP) for 2001–2005
2002:	Creation of the Central Technical Group (EPI-CTG)
2002:	Revision of EPI norms and standards
2002:	Reaching Every District (RED) introduced as pilot
2002:	Additional resources from GAVI, WHO, and UNICEF
2002:	Inventory of EPI equipment
2003:	RED extended to 14 health districts
2003:	External review of epidemiological surveillance of EPI diseases
2004:	Data quality audit
2004:	Plan for the rehabilitation of EPI equipment (2004–2013)
2004:	Introduction of yellow fever vaccine
2004:	Rehab of EPI equipment (2004–2013)
2005:	Introduction of hepatitis B vaccine
2005:	RED scaled up to all districts
2005:	Update of EPI norms and standards
2005:	External review of the EPI
2006:	Government promotes community role in chairing of management committees
2007:	cMYP (2007–2011)
2007:	First mid-level management courses (MLM)
2007:	Launch of Maternal and Child Health and Nutrition Week (SASNIM)
2008:	Introduction of Hib vaccine
2008:	Suspension of GAVI ISS funds
2008:	EPI funds from WHO and UNICEF
2010:	Launch of National Immunization Fund

country to regain the level of coverage achieved in the mid-to-late 1980s. Further increases in coverage have been associated with expansion of the health workforce, gradual strengthening of district health governance, and improved service delivery through adoption of the *Reaching Every District* (RED) strategy. National level respondents reported that improved EPI performance resulted from political and government commitment, including the free provision of vaccines and availability of financial and technical support from international partners (e.g., GAVI, WHO, and UNICEF) and nongovernmental organizations (NGOs). Other contributors to performance improvement included Cameroon's consistent application of strategies with operational components such as data quality management, planning at all levels of the immunization system, supportive supervision, coordination, strengthening and maintenance of infrastructure, equipment and flows of inputs, and meaningful community engagement.

More recently, the proportion of government funds directed to EPI has grown from 1.5 percent in 2006 to 3.3 percent in 2010. Over the same period, development partners contributed 78 percent of the total EPI budget. GAVI ISS funding, which had been used to award health districts for immunization performance, was suspended in 2008–2010, but a new allocation was made for 2011. The study team noted that most of the national factors which were attributed to driving performance had been in place prior to 2007. The continuing improvement, despite the brief faltering in coverage following GAVI ISS suspension, suggests that the impact of national inputs is cumulative and long-lasting.

Cameroon's EPI is directed by the Ministry of Public Health through a Central Technical Group, established in 2002, and dedicated teams in each of the country's 10 semi-autonomous regions. Operationally, RI services are managed and delivered to health districts by staff who integrate EPI with other duties. Districts are divided into health areas with one or more health facilities (also called Integrated Health Services) with their own outreach catchment areas and a team of nurses and nurse aids. The district and the health areas have Health Committees and Health Facility Management Committees comprised of health and district administrative officials and community

Figure 1. Trends in Pentavalent and Pentavalent3 Coverage from 1981–2010



representatives. District health systems are the crucial link between the national initiatives and performance improvement. The ARISE in-depth study focused on how district RI systems achieved high performance within the national context.

METHODS

The research in Cameroon used a mixed-methods multiple-case-study design,^{9, 10} enabling investigators to identify and explore the drivers that are critical for improving district-level RI system performance, how drivers influence performance, contextual factors impeding or promoting a driver's effectiveness, and relationships among the drivers. Cases were defined based on national level reports of immunization coverage (Penta3) and other selection criteria. Researchers selected three health districts showing recently increased coverage from 2007 to 2010 and one steady coverage district, defined as a district with little change in coverage during the same period.

The districts that were chosen for study are shown in Figure 2 and listed below:

Districts with improved coverage

- Kribi, South Region
- Ndop, Northwest Region
- Bali, Northwest Region

District with low and steady coverage

- Bafang, West Region

Sixteen Cameroonian and international researchers with experience in case study methodology, expertise in qualitative research and RI programs, and knowledge of the local context implemented the study in May 2011. Field work in the study districts began with sessions involving district health officials and was often complemented by sessions with administrative authorities. The study team spent time at the district capital and three or four sub-district health areas (*l'air de santé*) per district. The health areas were selected to represent the diversity of cultures, accessibility of services, availability of infrastructure, and RI performance. The study team reviewed and recorded immunization

Figure 2. Location of ARISE Study Districts



related administrative data at the district and health area level. The team also used a structured survey and observational checklist to document RI infrastructure and processes. Qualitative data collection involved over 100 unstructured and semi-structured interviews with health workers and managers, health service recipients, and representatives of key administrative and political institutions in each case study district. Focus group discussions were held with mothers and other community members. Stakeholders and experts involved in national level policy-making or implementation were also interviewed. One of the features of data collection was that the researchers asked every informant what was the most important factor that improved or sustained high vaccination coverage in their area or facility.

As often happens in field research, what was observed in the community was not always the same as what was described by the national data. As fieldwork progressed, the team found that district level administrative data reported different coverage estimates than those acquired at the national level. In all cases, coverage trends were similar. Coverage improved as reported, but levels of coverage differed slightly. The team also found evidence that coverage reports in Bali were not consistent with its immunization program experience. It became apparent that the RI system in Bali, which had been selected as the “steady” coverage district, had, in contrast, been performing very well for many years. This district was reclassified as a high performing district, and a new district (Bafang) with steady RI coverage was added as the fourth district.

The qualitative and quantitative data were analyzed in several steps to identify, refine, and validate the findings. First, researchers conducted a free-listing of informants’ reasons for improved RI performance to quantify the emic perspective of drivers of change.¹¹ Next, researchers conducted a detailed textual analysis of qualitative data from each district to identify and refine the drivers even further. Third, models were constructed that explained the critical elements of the drivers and the processes by which they influenced RI performance, and researchers compared the experience of districts where coverage improved with the steady district. These models were tested by returning to the qualitative data to determine the presence and strength of each driver in each district. Finally, the study team confirmed the link between the drivers of RI system performance and improved coverage by seeking corroboration from reported coverage data and the standard assessment of RI service delivery inputs.

Table 1. Contextual and Coverage Characteristics of the Four Study Districts

	KRIBI	NDOP	BALI	BAFANG
Region	South	Northwest	Northwest	West
Total population (2010)	114,952	197,215	73,614	135,646
Target population (children under one year, 2010)	4,598	7,889	2,945	5,426
Characteristics of settlement	8325 sq. km Rural with large urban center; rainy season impacts access	1115 sq. km Rural with rainy season access difficulties	240 sq. km Rural; highlands & rich farmland; strong cultural identity	958 sq. km Semi-urban; some isolated rural areas
Penta3 coverage rates in 2007 and 2010	72%; 88%	77%; 90%	34%; 33%	48%; 63%
Dropout rates between Penta1 and Penta3 in 2007 and 2010	14%; 18%	3%; 3%	11%; 3%	2%; 5%
Ratio of target pop. to vaccinators, 2010	121:1	91:1	Not available	226:1
HFs with immunization services pre-2000 vs. 2010	40 vs. 55	16 vs. 35	3 vs. 7	27 vs. 38
Estimate % vaccination given through fixed services	70	70	70	94
Working refrigerators	11	41	7	Not available
Stock-outs in past 12 months	None	None	None	Yes, but limited
Working motorbikes	5	7	7	11

Source: Coverage reported from national level administrative data.

Note: Coverage in Bali reported here is based on official administrative reports. The study team re-estimated coverage for Bali based on discussions with local program managers and determined that Bali's coverage had improved previously and remained at a high level for several years. These revised and informal estimates place Penta 3 coverage in Bali in 2010 at approximately 75 percent.

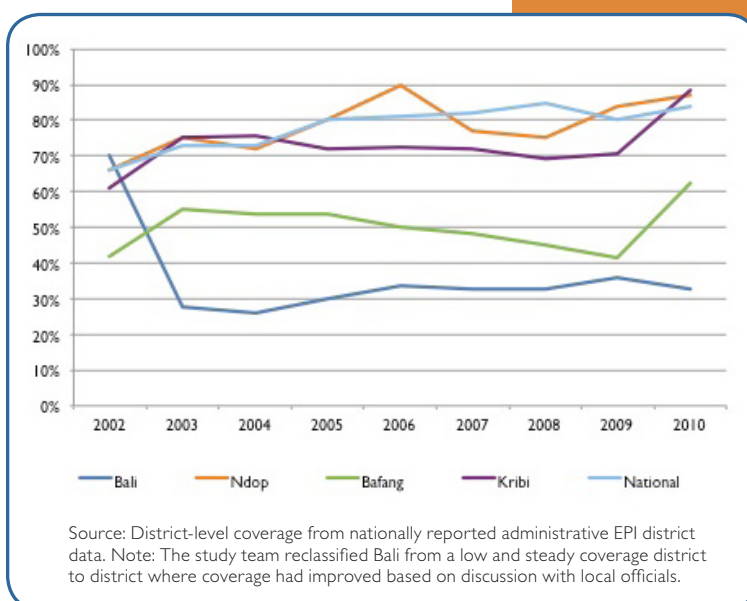
FINDINGS

Table 1 compares districts by basic contextual characteristics, coverage, dropout rates, and selected indicators of routine immunization system capacity. District populations range in size from 73,000 (Bali) to nearly 200,000 people (Ndop). Two districts are predominantly rural; the other two have urban settlements as well as agricultural areas. All districts face problems accessing some of their population during the rainy season. A review of national level administrative data revealed that Kribi District in the South and Ndop District in the Northwest achieved Penta3 coverage rates of more than 80 percent of eligible children in 2010, with recent increases from 2008 to 2009 (Figure 3).

Uncertainty about the population denominator¹² makes it difficult to be confident of a coverage estimate for the rural district of Bali in the Northwest region. It appears that the discrepancy in coverage estimates resulted from the use of population figures from 2003–2010 that reflected a significantly larger population than is actually present in Bali. Respondents confirmed that a local census conducted within the last five years for the purpose of health planning estimated the total population of Bali at around 20,000 as compared to the official figure of around 70,000. Moreover, the district is widely known to be one with very good access to health services. The steady district, Bafang, in West Region, had Penta3 coverage rates between 40 percent and 55 percent from 2002 and 2009, with an increase to 63 percent in 2010. The ARISE study districts were not among the highest performing districts in the country. Kribi and Ndop increased their ranking, moving from the lower half in 2007 to the upper half of districts in 2010. Bafang, the steady district, was among the districts with the lowest coverage in both years. Bali is reflected in both years as bottom and near-bottom of the ranking due to inaccurate denominator estimates noted above.

In the last 10 years, the districts have all seen an increase in the number of facilities providing immunization services. However, in 2010 Kribi and Ndop had a higher ratio of vaccinator to target population than the steady district.

Figure 3. Trends in DTP Coverage in the Four Health Districts, 2002 to 2010



The three districts with increased coverage provide a larger percentage of services through outreach than in the steady district. In other aspects of capacity, the districts appear similar. For example, vaccine availability in all districts was reliable, with only one 3-month stock out in 2010 in Bafang. In addition, the number of motorbikes available for outreach does not seem to explain the different performance experiences. Bafang has the most motorbikes (11), including six based in the capital of the district and five at the sub-district level.

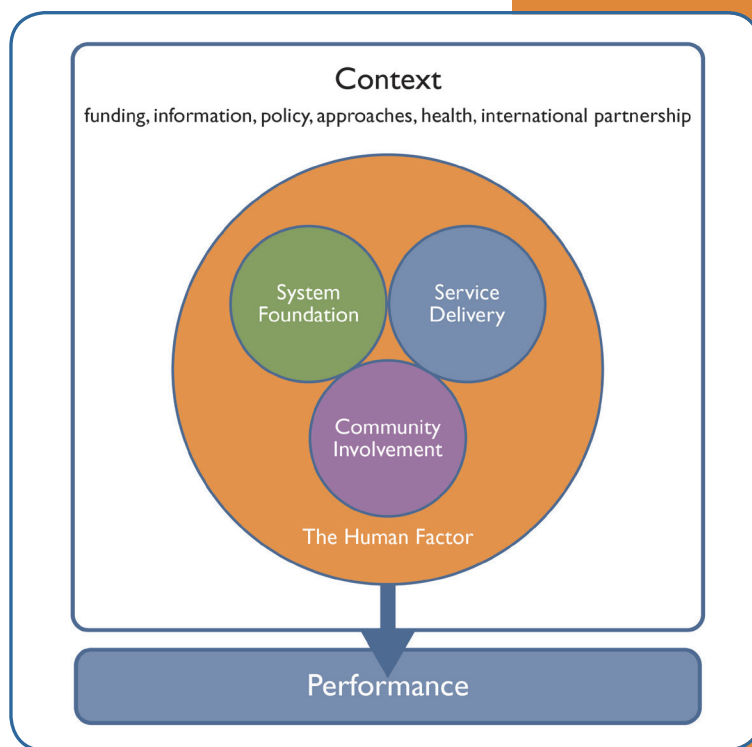
FRAMING RI PERFORMANCE DRIVERS

In-depth analysis of RI performance revealed 23 mechanisms by which RI performance improved at the district level. These examples of specific actions, policies, or resources that influenced performance were grouped into nine overall performance drivers that were common to the districts where coverage had improved and absent or weaker in the steady district. To further explain how these drivers map to the overall health system, the study team developed an Organizing Framework for RI Performance Drivers in Cameroon (Figure 4). This framework assigns drivers to three broad domains—*System Foundation*, *Service Delivery*, and *Community Involvement*—and introduces a category of catalytic forces deemed *Human Factors* that overlap and interact with the drivers to enhance their influence. The domains and catalysts are described below:

- *System Foundation* represents the principles, strategies, and health system resources and mechanisms that support the delivery of immunization services.
- *Service Delivery* includes both mechanisms relating to the types and quality of services and equipment (including transport) as well as the supplies required for service provision.
- *Community Involvement* includes not only formal mechanisms to inform and involve communities, but also the adaptation of these mechanisms to cultural and social milieu.

These three domains form a cohesive framework for performance improvement.

Figure 4. Organizing Framework for RI Performance in Cameroon



- The catalytic forces deemed *Human Factors* are woven through the other domains. They relate to the human behavior or characteristics that shape each domain and enable drivers within them to work effectively.

External influences on drivers and performance outcomes are also represented in Figure 4 and include factors such as global and national strategies and policies, legal frameworks, financing flows, and international partnership.

Table 2 summarizes the RI performance drivers and mechanisms grouped according to the domains of the organizing framework.

System Foundation

Within the system foundation domain, an analysis of district data revealed three key drivers of RI performance: stakeholder commitment, resources for implementation, and management systems. The pathway to performance that starts with stakeholder commitment and ends in increased coverage travels through processes such as budgeting, resource mobilization, and the focused mobilization of other actors such as development partners, the local government, and communities. National commitment to health programming and donor support underpinned many elements within this first domain represented by resource allocation to RI and political support. The three improving districts also attribute their success in RI to district and provincial leaders' prioritization of immunization services.

Here in Kribi, the first activity is immunization. It is an action that cannot be neglected. Some health data might be ignored in our coordination meetings, but never the data of the EPI.

Chief Consultant, Kribi Health District

As noted above, resource availability among all four districts was reliable and formed a strong foundation for coverage improvement; resource availability was also similar among districts. It varied mainly in terms of the ratio of health staff to population. Health workers in Bafang also noted they lacked resources to offer outreach and mobile services to segments of the population who were difficult to access or were resistant to vaccinations, and as a result, these populations often did not receive services.

System Foundation



Table 2. Summary of Common Drivers in Districts Where Coverage Improved

DOMAIN	DRIVER	MECHANISM
System Foundation	Strategic Approach	Stakeholder commitment
		Strategic planning
		Knowledge of local situation
	Implementation Resources	Availability of human resources
	Management Systems	Performance review meetings
		Data management
Service Delivery	Service Delivery Strategy	Tailored fixed-site strategies
		Tailored outreach strategies
		Follow-up and support strategies
	Quality of Services	Reception at facilities
		Concurrent services
	Infrastructure	Facilities
		Cold chain equipment
		Vaccine supply
Community Involvement	Communication	Transportation
		Implementation of communication strategies
		Routine communication
	Stakeholder Involvement	Additional communication channels
		Linked health and community structures
		Involving local authorities
	Community Ownership of Immunization	Involving community-based organizations
		Social acceptance of immunization
Human Factors (Catalyst)	Health Workforce Capacity	Integration of immunization into local the culture
		Technical skills of health and community workers
		Health worker behavior
	Social Inclusion	Social capital ^I
		Gender approach (women-focused)
	Motivation	Participatory approach
		Recognition

^I Social capital is about the value of social networks, bonding similar people and bridging between diverse people, with norms of reciprocity (<http://www.socialcapitalresearch.com/definition.html>).

Finally, interviews with health staff and community members in Kribi in particular pointed to strong management practices contributing to improved vaccination coverage. Respondents identified the use of regular performance review meetings as an effective management practice in all districts where coverage improved. In Kribi, investment in data management skills allowed the district to track its performance more effectively and target services to areas in greatest need.

Service Delivery

Under the service delivery domain, three performance drivers contributed to improved coverage: service delivery strategies, the quality of services, and infrastructure. In addition to prioritizing immunization, health managers in the three improving districts also based their strategies on a deep understanding of the local context and community needs. Specific strategies varied among districts. However, district teams in Kribi, Ndop and Bali regularly tailored their strategies to local needs, which was instrumental to coverage improvement. District success was grounded in a detailed understanding of the communities' preferred timeframe for providing vaccines in fixed and outreach services, effective communication with clients, identification of communities with low coverage, and a plan for targeting low coverage areas.

We organize immunization sessions on the last Friday of the month and the first Monday of the following month so that if a woman missed the Friday session, she can come on the Monday. We also o keep a tally of market days and adjust the immunization delivery agenda.

Bali respondent

In addition, in Ndop and Bali, delivery strategies prioritized registration of pregnant women and children with follow-up for completing the vaccination schedule. In addition, all three district teams where coverage improved worked closely with faith-based health service providers. In contrast, in some of Bafang's health areas, community members complained of poor communication with the community about the time and place of outreach services as well as the poor quality of services.

We never know when the nurse is coming (with vaccines) so that we can prepare."

Bafang respondent

Finally, in Ndop and Kribi, the health teams implemented a strategy where health workers were assigned to specific areas or zones for outreach

vaccination and would routinely return to these areas within the same communities rather than shift among work sites. Through repeated visits, they built strong ties to the community. The health workers learned in detail about the needs and the preferred service delivery days of a particular community, and the health worker and community developed a shared sense of responsibility for reaching all the children with vaccination.

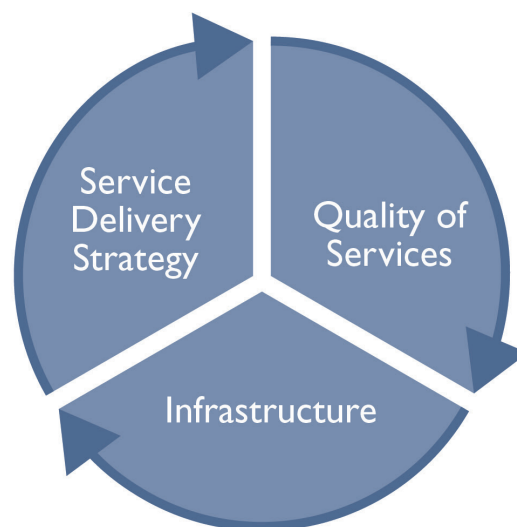
Offering high quality services was also an important factor in the service delivery domain. The study team observed that health facilities in the steady district were not as well maintained and attractive as facilities in other districts. Community members in the steady district were more likely to complain about the attitudes of the health workers or the lack of additional services such as weighing children during vaccination clinics. The steady district, Bafang, also mainly relied on fixed services, but informants reported that health workers sometimes refused to vaccinate a child because there were not enough children requiring the service to justify opening a vial of vaccine.

In contrast, two common aspects of service quality were linked to improved immunization coverage in Kribi, Ndop, and Bali – the manner of welcoming women to the health facilities and the concurrent availability of other health services alongside immunization. Using songs and messages that showed respect for women's needs and time commitment to their child's health care, the workers in these three districts made special efforts to make the services attractive. Government services felt some competition with faith-based services, and managers stressed the need to respect clients and not turn away latecomers at the end of the day. In Bali, clients from focus group discussions reported that the health worker gave the impression that he was just waiting for them to arrive to offer them and their children care. In addition, clients reported that the availability of other child health services given alongside immunization also drew women back to the health center on a regular basis.

Community Involvement

Key performance drivers under the domain of community involvement included communication, stakeholder involvement, and community ownership of immunization. District health teams made extra efforts to involve communities in program decisions and the delivery of RI. Cameroon

Service Delivery



has formal “dialogue structures” whereby the community participates in governing bodies from the central government level down to the health area. Although in some parts of the country health committees are not functioning fully, they were active in all three of the improving districts in the study. In addition to this formal engagement of stakeholders, high performing districts closely engaged local political, religious, and traditional authorities, women’s associations, and local NGOs.

At the mosque, we welcome nurses and vaccinators during immunization campaigns. Sometimes they just come and give us the messages for us to communicate to our members. We have a health committee. Ismala, one of the followers of the mosque is the chairman of that committee.

Key informant, Ndop

Communication is another vital part of the community involvement domain. Communication ranges from information campaigns to dissemination of pro-vaccination materials by local leaders to the delivery of personal messages about vaccination by health workers to mothers and among women in the community. This direct personal communication is probably the most effective and is most apparent when there is strong social and cultural ownership of the RI program. The study team found that social pressure on women to have their child immunized was very strong in the high performing districts. Messages about immunization also reached deep into the local culture. Women in Bali sang about healthy babies, vaccinations, and begging the nurse to see them quickly. These songs helped to link vaccinations with being a good mother. Although the steady district is populated by members of the same language group, there was no singing about vaccinations there.

Genuine involvement of the community and two-way engagement are also critical to improving RI performance. In the improving districts, the health sector was able to partner with women’s organizations and religious and traditional leaders to promote vaccinations. In Bali, district leaders from outside of the health sector mobilized the support of residents who had migrated abroad. Their donations greatly enhanced the health services. Ndop is an example of strong involvement in community mobilization built

Community Involvement



upon strengthened community-based organizations stabilized through training. The district also effectively integrated social mobilization organizers into a range of health education activities and decision-making processes.

Catalytic Human Factors

The final aspect of the organizing framework captures the use of strategies to manage interpersonal relations, engage groups without formal power, and reward initiative among health workers: the human factors. Each was critical in mobilizing new resources and reaching underserved or resistant communities. In many cases, it was those catalytic factors of RI system performance that distinguished districts with high RI performance from those with lower, steady performance.

The first element is workforce capacity. The System Foundation domain above included the notion of ensuring an adequate number of workers. Workforce capacity relates to efforts to enhance the quality of the workforce through recruitment of people with new skills and focused training. In Kribi, the Chief Consultant recruited staff to improve data management, and in Bali, the head nurse incorporated community workers into the service delivery mechanisms in order to increase his ability to offer both fixed and outreach services. These investments in human capital extended beyond the health workforce to enable stronger ties of mutual respect between local stakeholders and the health sector. This kind of strategic relationship building is critical for the improvement of RI system performance because it allows districts to access new financial resources and avenues for the service delivery.

A second common strategy for enhancing RI performance in the improving districts is motivating staff and communities through recognizing their contribution to immunization activities. Recognition comes in many forms that may involve a letter to health workers or a community from the national level or financial rewards, as in Ndop, where the district health chief had a partnership with local NGOs, so he could give community workers “a little something” to reward their efforts. Recognition also comes in the form of in-kind resources, such as appropriate housing, access to essential work tools such as a motorbike, mobile phone, or computer. Public expressions of gratitude and thanks for services provided

Human Factors



encouraged health workers and community members to continue to make personal sacrifices to deliver care.

The last dimension of these catalytic human factors is social inclusion. The study team documented many successful initiatives in the better performing districts to engage women and increase acceptance of vaccinations among isolated groups such as the migratory Baka (pygmies). In Ndop, the health district health chief encouraged the placement of women at the highest decision-making level in community structures. In Bali, the district health chief formed a direct link to powerful women's organizations, which are central to community mobilization. Kribi, Ndop, and Bali health managers also developed a good rapport with local leaders that boosted local demand for immunization and reduced resistance among certain groups.

IMPLICATIONS

Since Cameroon gained its independence, national immunization coverage has improved steadily. The rare moments of stagnation or slight decline seem to be linked to passing periods of economic crisis or a temporary deficit in international financial support. At the central level, respondents reported that improved performance over the years in Cameroon was based on consistent political will and government commitment to immunization and child health, the availability of financial and technical support from international partners (e.g., GAVI, WHO, and UNICEF, and international NGOs), and Cameroon's consistent application of relevant strategies focused on performance improvement (e.g., RED and others). These strategies strengthened subnational service delivery through improved data quality and use; planning; supportive supervision; coordination; strengthening and maintenance of infrastructure and equipment; and meaningful community engagement.

Within this supportive national context, the ARISE in-depth investigation of routine immunization systems identified nine drivers that influenced recent improvements in DTP3/Penta3 coverage. All nine drivers were present in the three districts where coverage improved and weaker or absent in the "steady" comparison district. Within these driver categories, the research uncovered different mechanisms that districts employed to improve the supply of immunization and its acceptance by the community.

Other studies have also reported multiple factors influencing positive changes in immunization performance. However, the ARISE study in Cameroon goes further to construct a unifying framework to guide the conceptualization of performance improvement for routine immunization

systems. The framework highlights three important and mutually reinforcing domains that are critical to understanding routine immunization performance improvement pathways—*System Foundation; Service Delivery; and Community Involvement*. In addition, catalytic “people-focused” strategies motivate both health workers and caretakers and enable them to contribute successfully to achieving program goals.

The results of the study of drivers of routine immunization performance in four districts in Cameroon may have a number of practical policy implications for other sub-Saharan African districts.

First, common to all districts where coverage improved was the solid foundation provided by the **regular availability of the essential components of the immunization system**: trained staff, vaccines and cold chain, transportation, and sufficient sites from which to deliver immunizations. Without this foundation, many of the driver mechanisms could not perform effectively and facilitate coverage improvement.

Second, in districts where coverage improved, managers and health workers focused delivery strategies on **reaching the community**. In Kribi health district, performance was fueled by a strong focus on outreach. Managers also assigned the same health worker to specific outreach sites to build a continuous relationship between the health worker and the community and a shared commitment among them to reaching all children with vaccines. In Ndop, health managers and workers emphasized the quality of services, the cleanliness of service sites, and health worker respect for caretakers. As such, Ndop workers built a reputation for the health services that drew people back for care on a regular basis. They also reached out to the community to find defaulters and encourage them to complete their child’s immunization schedule. Bali respondents stressed the importance of community cohesion and regular, reliable and quality immunization services delivered by knowledgeable health workers. In both Ndop and Bali, health workers used participatory methods to work with community groups and individual clients in many aspects of programming. Work approaches that included strong references to local culture and listening to suggestions created a trust within which both health workers and community members could work effectively. In contrast, respondents in Bafang, where coverage did not improve, noted that lack of resources for conducting immunization outreach and limited community involvement left pockets of the population without services.

Third, district experience with coverage improvement suggests that the **drivers do not operate in isolation but instead feed into and support one another in various ways**. For example, the suspension of external funds

appeared in several interviews as a detrimental influence on coordination, supervision, and staff motivation. Yet, the national and district level actors found ways to accommodate this change in resource availability by channeling alternative funding sources and mustering additional efforts to deliver vaccination services. The coverage decline and recovery after the suspension resulted from both the capacity of the system to compensate for changes in external funding flows (by using state and private resources) and the capacity of the immunization system to adapt to changing circumstances as needed. This flexibility spurred the introduction of new strategies related to service integration, reorganization of campaign strategies, and eventually the strengthening of cooperation with international partners.

Fourth, in districts where coverage improved, **districts teams tailored strategies to local conditions and needs**. Their knowledge of the local setting and application of that knowledge enabled those district teams to work within resource constraints and reach communities with immunization services. Thus, critical to understanding performance change is the notion that it is not only the presence of drivers that ensures performance improvement, but also how these elements are introduced, implemented and prioritized in a specific setting. In Ndop, for example, district managers and workers augmented standard outreach strategies by involving community-based health committees and influential community groups to spur commitment from local government and caretakers to immunization. Other managers took the standard RED strategy to focus on “Reaching Every Child,” tailoring a global approach to the local context and engendering ownership and commitment. This creative application of resources and ideas to problem solving or goal achievement required local capacity among leaders and managers to understand strategic concepts, re-think them, and adapt them effectively.

ENDNOTES

- 1 In this report, the term Africa refers to the 46 countries in the World Health Organization Africa Region (WHO/AFRO).
- 2 World Health Organization/United Nations Children's Fund (WHO/UNICEF) coverage estimates for 1980 to 2010, as of July 2010. Available at: http://apps.who.int/immunization_monitoring/en/globalsummary/country/profileselect.cfm.
- 3 ARISE is managed by the JSI Research & Training Institute, Inc. (JSI) and funded by the Bill & Melinda Gates Foundation. JSI's partners on the ARISE project are, in Uganda, the School of Public Health at Makerere University and, in the United States, the Dartmouth Institute, at Dartmouth College, and the School of Public Health at George Washington University.
- 4 DTP3 or Penta3 are accepted indicators of routine immunization system performance.
- 5 Landscape Analysis Synopsis: An Initial Investigation of the Drivers of Routine Immunization System Performance in Africa (May 2011). Arlington, VA: John Snow, Inc./ ARISE Project for the Bill & Melinda Gates Foundation. Available at: <http://arise.jsi.com/landscape-analysis-2/>.
- 6 The full Ethiopia case study report, reports and briefs on ARISE research in Cameroon and Ghana, and synthesized findings of the ARISE project are available at <http://arise.jsi.com/>.
- 7 United Nations Human Development Report 2011. <http://hdrstats.undp.org/en/countries/profiles/CMR.html>.
- 8 Cameroon health statistics available from WHO Global Health Observatory Data Repository. <http://apps.who.int/ghodata/?vid=5800&theme=country#>.
- 9 Lin R.K. (2009). *Case Study Research Design and Methods*, 4th edition. Thousand Oaks, CA: Sage Publications.
- 10 Health service research is often criticized for focusing on barriers that are not relevant to managers who want to identify evidence-based strategies that work (Bosch-Capblanch, Kelly & Garner, 2011). The ARISE design was informed by methodological approaches, such as realistic evaluation and positive deviance, that offer more nuanced understanding of how health systems work and provide more practical guidance for managers (B Marchal, M Dedzo & G Kagels, 2010a; B Marchal, M Dedzo & G Kagels, 2010b; Pawson, 2002; Pawson, Greenhalgh, Harvey & Walshe, 2005).
- 11 For information on free listing and other qualitative analysis techniques see the manual and associated information from the ANTHROPAC program <http://www.analytictech.com/anthropac/apacdesc.htm>.
- 12 Bali health district was initially selected for comparison as the district where coverage had remained steady from 2007–2010. On arrival in Bali, however, initial discussions and investigations revealed significant discrepancies between official coverage estimates and actual program performance. To verify the district selection, the research team reviewed district level coverage data from local reports and conducted informal spot checks of children's immunization status using home visits. These investigations as well as the results of in-depth interviews and observations depicted Bali as a health district with stable but high level immunization coverage and well-functioning program activities. The graph represents data using the official denominator, and thus reflects the reported lower coverage level. The acute denominator problems found in Bali demonstrate how denominator inaccuracies continue to pose substantial challenges to the EPI in many countries. Based on these findings, the classification of Bali was changed from a "steady" coverage district (reflecting no performance improvement) to an improved coverage district. Bali appears to represent a district with high levels of coverage whose coverage had improved prior to the study period and stayed at a high level since then.
- 13 Naimoli, J. F., Challa, S., Schneidman, M., & Kostermans, K. (2008). Toward a grounded theory of why some immunization programmes in sub-Saharan Africa are more successful than others: a descriptive and exploratory.



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