



AFRICA ROUTINE IMMUNIZATION SYSTEM ESSENTIALS

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IMPROVING THE PERFORMANCE OF ROUTINE IMMUNIZATION SYSTEMS IN AFRICA

A CASE STUDY OF THE DRIVERS OF ROUTINE IMMUNIZATION SYSTEM
PERFORMANCE IN CAMEROON





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ACRONYMS

AIDS	Autoimmune deficiency syndrome
ARISE	Africa Routine Immunization System Essentials
BAAF	Office of Administrative and Financial Affairs
CFA	Cameroon francs
cMYP	Comprehensive multi-year plan
COGE	Health Facility Management Committees
CENAME	Cameroon National Central Drug Supply
COSA	Health Committees
CSSS	Higher Center for Health Sciences
CTG	Central Technical Group
CUAC	Catholic University of Central Africa
CWA	Catholic Women's Association
CWF	Christian Women's Fellowship
DHS	Demographic and Health Survey
DTP3	Diphtheria-tetanus-pertussis vaccine, third dose
EPI	Expanded Programme on Immunization
GAVI	Global Alliance for Vaccines and Immunizations
GDP	Gross domestic product
HIPC	Highly Indebted Poor Countries initiative
HIV	Human immune deficiency virus
ICC	Inter-Agency Coordination Committee
IMF	International Monetary Fund
ISS	Immunization Services Support
JSI R&T	John Snow Inc. Research and Training Institute
MDGs	Millennium Development Goals
MOH	Ministry of Health
NGO	Nongovernmental organization
Penta3	Pentavalent vaccine, third dose
RED	Reaching Every District
RI	Routine immunization
SASNIM	Maternal and Child Health and Nutrition Week
UCI	Universal Childhood Immunization
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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EXECUTIVE SUMMARY

On a global scale, immunization coverage—expressed as the percentage of children who have received the third dose of diphtheria-tetanus-pertussis vaccine (DTP3)—has increased substantially over the past three decades. The proportion of infants vaccinated with a third dose of the diphtheria-tetanus-per tussis (DTP) vaccine grew to 77% in 2010 from 55% in 2000 (World Health Organization, 2011). However, coverage rates for a third dose of DTP (DTP3) and for a third dose of pentavalent vaccine (penta3), which combines the DTP vaccine with vaccines for hepatitis B (HepB) and Haemophilus influenza type b (Hib), still vary greatly among and within countries, and pockets of low vaccination coverage are common. Some of Africa's most populous countries—Nigeria, South Africa, Democratic Republic of the Congo, and Uganda—have coverage rates well below the target of 80%, as do many districts throughout the continent.¹

Cameroon is among three countries in Central Africa to achieve at least 80-percent Penta3 coverage in 2010.² The case study documented here presents the first systematic and comprehensive effort to identify and analyze the reasons for Cameroon's immunization performance experience. Such a study is particularly useful now, because Cameroon has recently decided to introduce new vaccines into the national immunization schedule. In addition, improved understanding of routine immunization performance could help other sub-Saharan African countries improve their coverage rates. This multi-site case study is part of a larger research effort—the African Routine Immunization System Essentials (ARISE) project—conducted by the John Snow, Inc. Research and Training Institute (JSI R&T) to advance understanding of the factors driving improved routine immunization (RI) performance in sub-Saharan Africa.³

In its initial phase, ARISE conducted a landscape analysis to examine written documentation and existing data on RI systems in Africa and seek input from implementers and technical and development partners to improve understanding of the drivers of system performance (JSI R&T, 2011). To explore the relevance of these drivers and understand better how they work in practice, ARISE conducted in-depth studies of selected districts in Ghana and Ethiopia as well as Cameroon. These case studies explore not only *which* drivers are critical for improving district-level RI system performance but also *how* they influence performance, the *contextual factors* impeding or promoting their effectiveness, and the *relationships* among different drivers.

The literature review revealed few studies or concepts explaining the drivers of immunization system performance. An exception (Naimoli, et al.; 2008) studied success factors for RI in sub-Saharan Africa using the following categories: governance and institutional frameworks,

¹ 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>

² Cameroon introduced pentavalent vaccine in 2008. Hereafter all data relating to DTP coverage in Cameroon will be expressed as Penta3.

³ Funding for ARISE is from the Bill & Melinda Gates Foundation.

management, strategy, mothers' demand, and funding. The ARISE study also adopted thematic fields or levels of analysis using an inductive approach based initially on interviews with key informants. It then built on field-level exploration of drivers at the district level to refine these themes and the link between drivers and RI performance.

METHODS

The research took a comparative case-study approach, using both quantitative and qualitative methods for data collection and analysis. The cases were defined based on immunization coverage (Penta3). Researchers selected three health districts (Kribi, Ndop, and Bali) whose data for the period showed increased performance in Penta3 coverage and one district (Bafang) whose data for the period showed steady coverage, with little change. To complete the study in Cameroon, JSI formed a multidisciplinary team of sociologists, anthropologists, public health specialists, statisticians, and officials in charge of operations of the Expanded Programme on Immunization (EPI) in the country. The research team conducted a comprehensive exploration of RI performance drivers and a comparative analysis to identify and analyze drivers in different settings. The study primarily employed unstructured and semi-structured interviews with individual respondents to explore the immunization system context, immunization performance, and the drivers of performance. Interviews were conducted at central, regional, health district, facility, and community levels. Respondents were health directors, managers, and workers; community members, including clients and administrators; and development partners. Free listing⁴ of the drivers of performance was conducted at the end of each interview. Researchers also conducted focus group discussions, systematic site observations, and home visits. Tools were also designed to collect data from the health service records and reports found in district health offices and health facilities from 2007 through 2010, focusing on doses of Pental, Penta3, and measles vaccine. Another tool was employed to collect data on numbers and types of staff, refrigeration equipment, transportation resources, and program activities. Finally, an observation guide was used to collect additional data on the condition of infrastructure, equipment, registers, and refrigeration equipment.

Quantitative data were entered into SPSS software⁵ for descriptive analysis of immunization system performance at the district-level. Qualitative data were analyzed for the purpose of free listing using ANTHROPAC software,⁶ which produces frequencies and ranking of potential performance drivers based on interview responses. The entire set of text-based data (a total of 154 interviews and observations) was coded using Ethnograph software⁷ and grouped by health district and theme. Finally, the quantitative and qualitative data were integrated to elaborate on potential drivers, confirm their correct identification, and explain their links to performance.

4 "Free listing" is an anthropological data collection method in which an informant is asked to list all the different kinds of some category (e.g., the factors that may impact RI system performance). "This method is used as a preliminary exploration of a 'domain' (a list of words or concepts in a culture which belong together). Delineating relevant domains is the means by which researchers understand a culture's beliefs." (http://www.jhsph.edu/bin/c/i/study_method.PDF)

5 SPSS (originally, Statistical Package for the Social Sciences) has been in use since its release by IBM Corporation in 1968 for statistical analysis in the social sciences.

6 ANTHROPAC is a free program for cultural domain analysis.

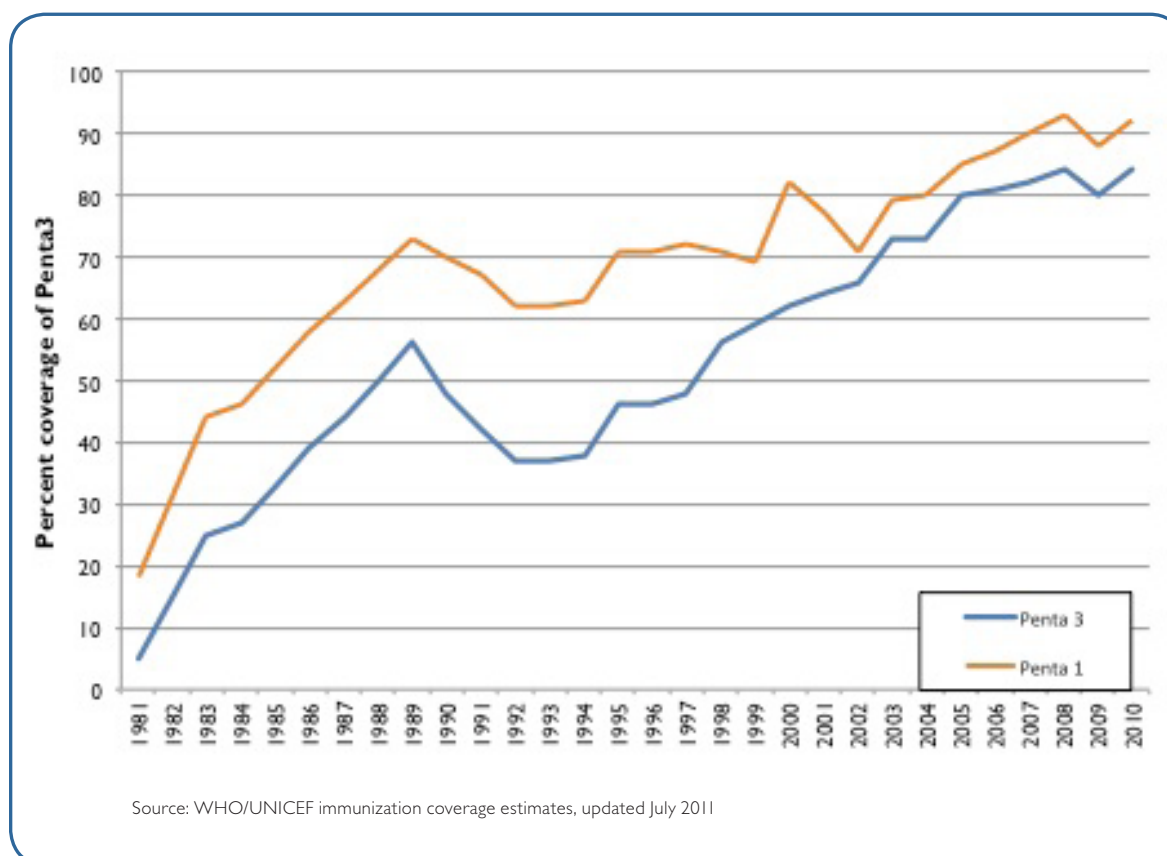
7 Ethnograph is a software used to analyze qualitative data.

THE CONTEXT OF CAMEROON'S EXPANDED PROGRAMME ON IMMUNIZATION

Immunization coverage in Cameroon has grown steadily from 1980 onwards. The most spectacular advances were made in the 1980s, during the global pursuit of universal childhood immunization (UCI). However, in spite of technical and financial support from the United Nations Children's Fund (UNICEF) and others, UCI was not achieved and coverage fell in the early 1990s. Since then, Penta3 coverage has improved consistently, reaching just above 80 percent in 2010 (World Health Organization [WHO]/UNICEF, 2011). The first decline in national immunization coverage corresponds with Cameroon's general economic crisis and structural adjustment, both of which affected health policies and health spending. The most recent decline in national coverage in Cameroon appears to correspond to the suspension in 2008 of the country's eligibility for Immunization Services Support (ISS) from the Global Alliance for Vaccines and Immunizations (GAVI), which until then had been a major external financial partner. It is likely that the increase in coverage observed in 2010 relates to considerable government involvement in activities to reach unvaccinated and under-vaccinated children and to reinstate performance-based funding from GAVI.

At the district level, trend data indicate that the increase in national RI coverage during the ARISE study period (2007 through 2010) began in 1995, possibly influenced by the new dynamic of community health construction and decentralization and supported by other investment in primary health care and steady support for building the immunization

Figure ESI. Trends in Penta3 coverage, 1981–2010



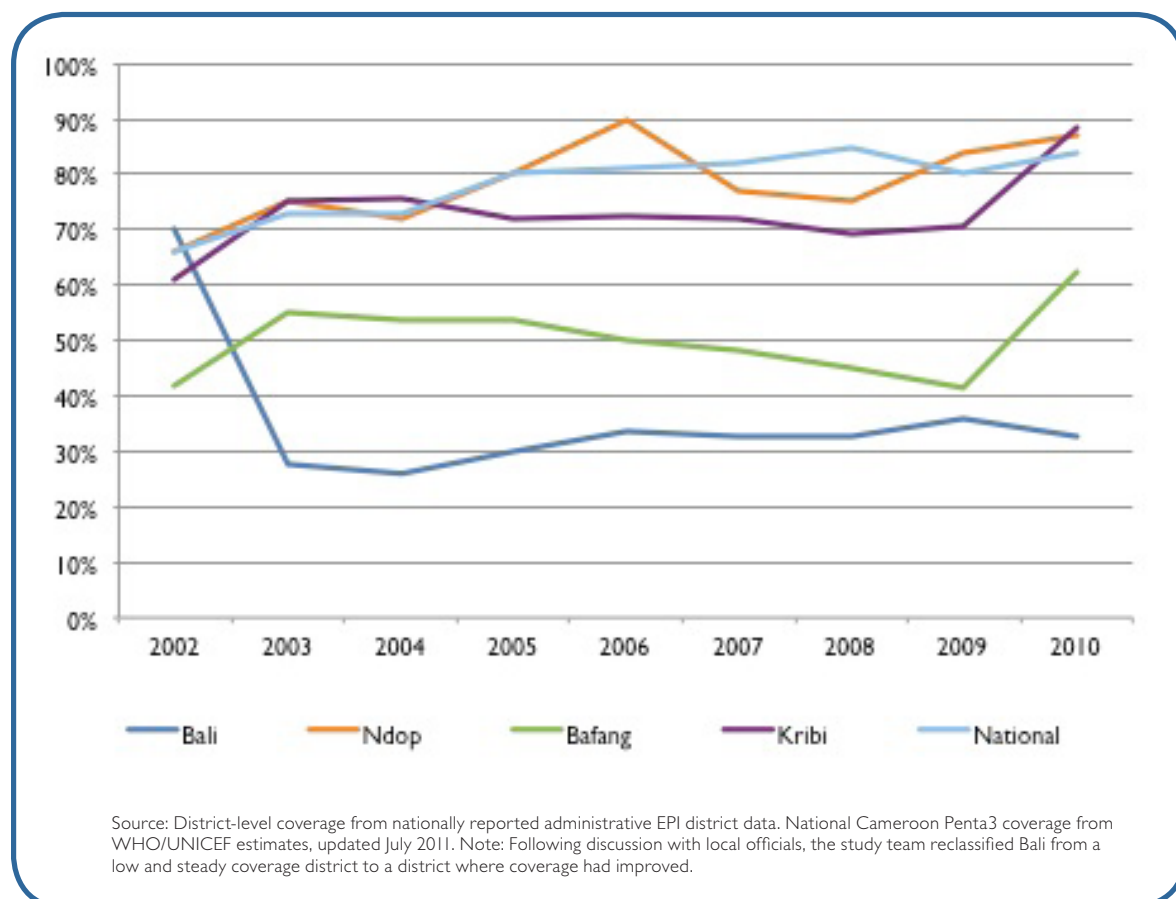
infrastructure. Thus, we hypothesize that many of the drivers that powered performance during the study period were present in some form before that period. The recovery of coverage following suspension of GAVI ISS funding seems likely to have stemmed from the intensification of activities such as Maternal and Child Health and Nutrition Week (SASNIM) and from programs and strategies implemented to fill the gap that the suspension created. In spite of positive national trends in coverage, pockets of low coverage or slower growth in coverage remain.

IMMUNIZATION PERFORMANCE IN THE STUDY DISTRICTS

Figure ES2 shows Penta3 coverage trends from 2002 to 2010 in the four study districts.

Table ES1 compares districts by basic contextual characteristics, coverage, and selected indicators of immunization system capacity. In the past ten years, the health districts with recent improvements in coverage have seen a greater increase in the number of facilities providing immunization services than in the steady coverage district (Bafang). The ratio of the vaccinator to target population is lower in Bafang than in the other districts. In other aspects of capacity, the districts appear similar. For example, vaccine availability in all districts was reliable, with only one three-month stock out in 2010 in Bafang. In addition, the number

Figure ES2. Penta3 coverage in four study districts and Cameroon national trend, 2002-2010



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 subdistrict level.

Table ES1. Contextual and coverage characteristics of 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% ⁸	48%; 63%
Dropout rates between Pental and Penta3 in 2007 and 2010	14%; 18%	3%; 3%	11%; 3%	2%; 5%
Ratio of vaccinators to target pop., 2010	1:121	1:91	Not available	1:226
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.

In total, researchers identified 23 mechanisms that improved RI coverage 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

⁸ Coverage in Bali reported here is based on official administrative reports from 2010. The study team re-estimated coverage estimates for Bali based on discussions with local program managers (see discussion below) and determined that Bali's coverage had improved rather than remained steady and at a low level. These revised and informal estimates place Penta 3 coverage in Bali in 2010 at approximately 75 percent—not 33 percent as shown in Table ES2.

framework for RI performance drivers in Cameroon (Figure ES3). This framework assigns drivers to three broad domains and introduces a category of catalytic forces that overlap and interact with the drivers to enhance their influence. The domains are:

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

The catalytic forces—deemed **Human Factors**—are woven throughout these domains. They relate to the human behavior or characteristics that shape each domain and enable the drivers within them to work effectively. The human factors include technical and professional competence that influences the design, management, and delivery of services; gender and gender roles; the extent of participation by communities; the degree of transparency in human and institutional interactions; and the motivation of service providers and community actors.

External influences on drivers and performance outcomes are also represented in the organizing framework (as shown in Figure ES3). They include factors such as global and national strategies and policies, legal frameworks, financing flows, and partnerships.

Table ES2 summarizes the RI performance drivers and related mechanisms that were common to districts where coverage improved and were absent or weak in the district with steady coverage.

Figure ES3. Organizing framework for RI performance drivers in Cameroon

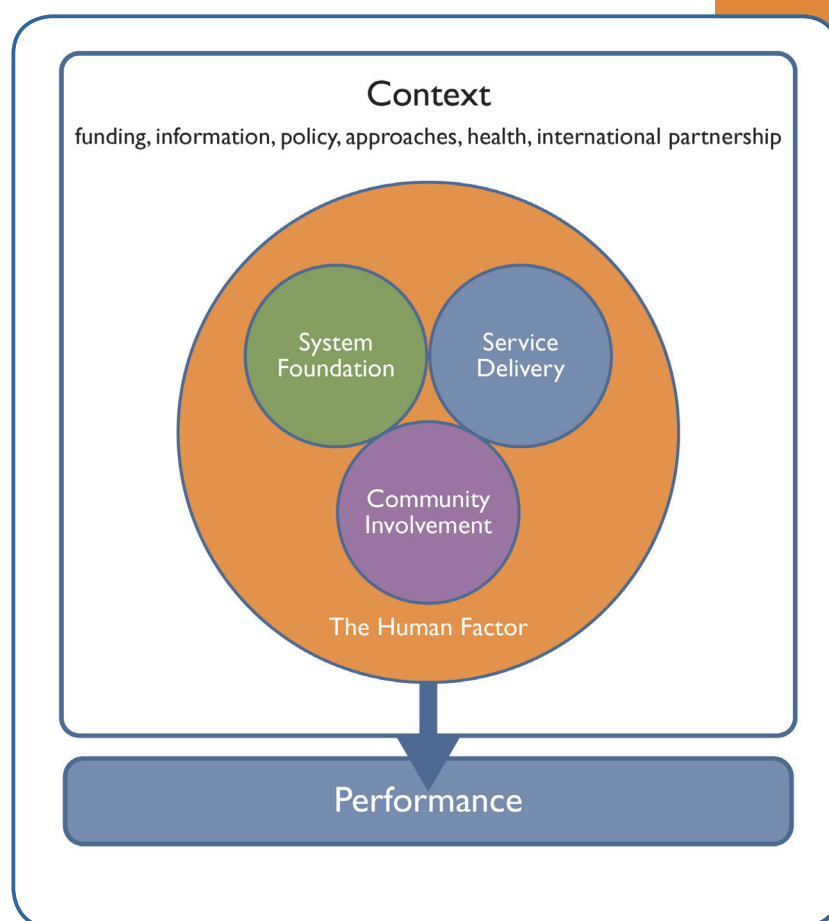


Table ES2. Summary of common drivers in districts where coverage improved

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
Transportation		
Community Involvement	Communication	Implementation of communication strategies
		Routine communication
		Additional communication channels
	Stakeholder Involvement	Linked health and community structures
		Involving local authorities
		Involving community-based organizations
	Community Ownership of Immunization	Social acceptance of immunization
Integration of immunization into local the culture		
Human Factors (Catalyst)	Health Workforce Capacity	Technical skills of health and community workers
		Health worker behavior
		Social capital ⁹
	Social Inclusion	Gender approach (women-focused)
		Participatory approach
	Motivation	Recognition

⁹ 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>).

DISCUSSION AND CONCLUSIONS

Since Cameroon gained its independence in 1972, national immunization coverage has improved steadily. Rare moments of stagnation or slight decline seem to be linked to passing periods of economic crisis or a temporary drop in international financial support. At the central level, respondents gave the credit for Cameroon's performance to consistent political will and government commitment to immunization and child health; to financial and technical support from international partners (e.g., GAVI, WHO, UNICEF, and international NGOs); and to the country's consistent application of RI performance strategies such as the reaching every district approach (RED). Subnational service delivery gained strength from improvements in 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 investigation of RI systems focused on four districts to explore in depth the drivers of RI performance improvement. Other studies have also reported multiple factors influencing positive changes in immunization performance (Naimoli, 2008). However, the ARISE study in Cameroon goes further, constructing the organizing framework described above to guide the conceptualization of performance improvement for RI systems. The framework consists of three important and mutually reinforcing domains that are critical to understanding RI performance improvement pathways. The framework also describes catalytic "people-focused" strategies that motivate health workers and caretakers to achieve immunization program goals. The human factors underpinning the framework's three domains enhances the effectiveness of the drivers, by focusing on areas such as participatory decision making, respectful behavior between health workers and clients, and empowerment of people at all levels with technical skills.

The study of drivers of RI performance in four districts in Cameroon has 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 a sufficient number of sites for delivery of immunizations. Without this foundation, many of the other driver mechanisms would not have been so successful in improving coverage.

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 made permanent assignments of health workers to outreach sites to foster cohesive relationships between the health worker and the community and a shared commitment to reach all children with vaccines. In Ndop, health managers and workers emphasized the quality of services, the cleanliness of service sites, and health workers' respect for caretakers. In so doing, Ndop workers built a good reputation for the health services that drew people back for care on a regular basis. The workers also reached out to the community to find defaulters and encourage them to complete their children's immunization schedules. Bali respondents stressed the importance of community cohesion

and regular, reliable, and high-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. They made forceful references to local culture and listened to suggestions, inspiring trust that allowed them to 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 a variety of ways**. For example, GAVI's suspension of funds came up in several interviews as a detrimental influence on coordination, supervision, and staff motivation. Yet actors on the national and district level found ways to accommodate this decline in resources, by channeling alternative funding sources and mustering additional efforts to deliver vaccines. The decline and recovery of immunization coverage after the suspension resulted from the immunization system's capacity to compensate for changes in external funding flows (using state and private resources) and also to its capacity to adapt to changing circumstances as needed. This flexibility has spurred the introduction of new strategies for service integration, the reorganization of RI 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 these district teams to work within resource constraints and reach communities with immunization services. Thus, critical to understanding performance change is the notion that improvement depends not only on the drivers described in this report but also on the ways these drivers 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 the commitment of local government and caretakers to immunization. Other managers took the WHO's RED strategy and renamed it "Reaching Every Child," tailoring a global approach to their local context and engendering ownership and commitment. This creative application of resources and ideas to solve problems and achieve goals required local leaders and managers to understand strategic concepts, rethink them, and adapt them effectively.

I. INTRODUCTION

On a global scale, immunization coverage—expressed as the percentage of children who have received the third dose of diphtheria-tetanus-pertussis vaccine (DTP3)—has increased substantially over the past three decades. The proportion of infants vaccinated with a third dose of the diphtheria-tetanus-per tussis (DTP) vaccine grew to 77% in 2010 from 55% in 2000 (World Health Organization, 2011). However, coverage rates for a third dose of DTP (DTP3) and for a third dose of pentavalent vaccine (penta3), which combines the DTP vaccine with vaccines for hepatitis B (HepB) and Haemophilus influenza type b (Hib), still vary greatly among and within countries, and pockets of low vaccination coverage are common. Some of Africa's most populous countries—Nigeria, South Africa, Democratic Republic of the Congo, and Uganda—have coverage rates well below the target of 80%, as do many districts throughout the continent.¹⁰

Cameroon is among three countries in Central Africa to achieve at least 80% Penta3 coverage in 2010.¹¹ Pentavalent (Penta) vaccine combines the DTP vaccine with vaccines for hepatitis B and hemophilus influenza b.¹² Cameroon's DPT3/Penta 3 coverage shows steady progress particularly from 2000 to 2010 when it increased from 62% to 84%.¹³ The country's comprehensive Multi-Year Plan (cMYP) for 2007–2011¹⁴ cites the following reasons for this success:

- political commitment to and social acceptance of immunization and the national Expanded Programme on Immunization (EPI)
- implementation of the Reaching Every District (RED) approach
- development at the district level of micro-planning, with community participation
- in-service training of health personnel and supervision
- establishment of efficient monitoring systems at the district level

The case study documented here builds on the cMYP, presenting the first systematic and comprehensive effort to identify and analyze the reasons for Cameroon's immunization performance experience. Such a study is particularly useful now, because Cameroon has recently decided to introduce new vaccines into the national immunization schedule. In addition, improved understanding of routine immunization performance could help other sub-Saharan African countries improve their coverage rates.

¹⁰ 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>

¹¹ Cameroon introduced pentavalent vaccine in 2008. Hereafter all data relating to DTP coverage in Cameroon will be expressed as Penta3.

¹² The other two countries are Burundi and the islands of Sao Tome and Principe.

¹³ Source: WHO/UNICEF, 2011.

¹⁴ Comprehensive Multi-Year Plan (cMYP), 2007, p. 11.

This multi-site case study is part of a larger research project conducted by the John Snow Inc. Research and Training Institute (JSI R&T). This project—The African Routine Immunization System Essentials (ARISE)—advances understanding of the factors contributing to successful routine childhood immunization performance.¹⁵ The ARISE project has the following objectives:

- create an evidence base to improve understanding of the drivers of routine immunization (RI) system performance
- deepen and broaden African and global stakeholder engagement in improving RI
- position the learning from the project to improve RI systems in Africa, identify potential investment options, and clarify stakeholder roles

In the study's initial phase, ARISE conducted a landscape analysis to examine written documentation and existing data on RI systems in Africa and seek input from implementers and technical and development partners to improve understanding of the drivers of system performance (JSI R&T, 2011). To explore the relevance of these drivers and understand better how they work in practice, ARISE conducted in-depth studies of selected districts in Cameroon, Ghana, and Ethiopia. These case studies explore not only *which* drivers are critical for improving district-level RI system performance, but also *how* they influence performance, the *contextual factors* impeding or promoting their effectiveness, and the *relationships* among different drivers.

To complete the study in Cameroon, JSI formed a multidisciplinary team of sociologists, anthropologists, public health specialists, statisticians, and officials in charge of EPI operations in the country. The study was coordinated by the Higher Center for Health Sciences (CSSS) of the Catholic University of Central Africa¹⁶ (Yaoundé, Cameroon).

The team took a comparative case study approach that focused on three health districts with recent improvement in Penta3 coverage and one health district with steady (not increasing) coverage. Most of the methods were qualitative, but the team used quantitative methods, as well. The fieldwork was conducted between May and July of 2011 at central, regional, and health district levels. Okola health district was used for pilot tests of data collection tools.

Section Two of this report presents the approach to site selection and methodology. Section Three describes the social, economic, and political context and the national health care system in Cameroon, and pays special attention to the country's EPI. Section Four discusses immunization system performance in the four study districts. Section Five describes the study's approach to identifying RI performance drivers. Section Six integrates the findings from the four districts, discusses the drivers of RI performance and the pathways identified for improving RI performance. Section 7 presents the implications of the findings for current and future RI policies in Cameroon and elsewhere in sub-Saharan Africa.

¹⁵ Funding for ARISE is from the Bill & Melinda Gates Foundation.

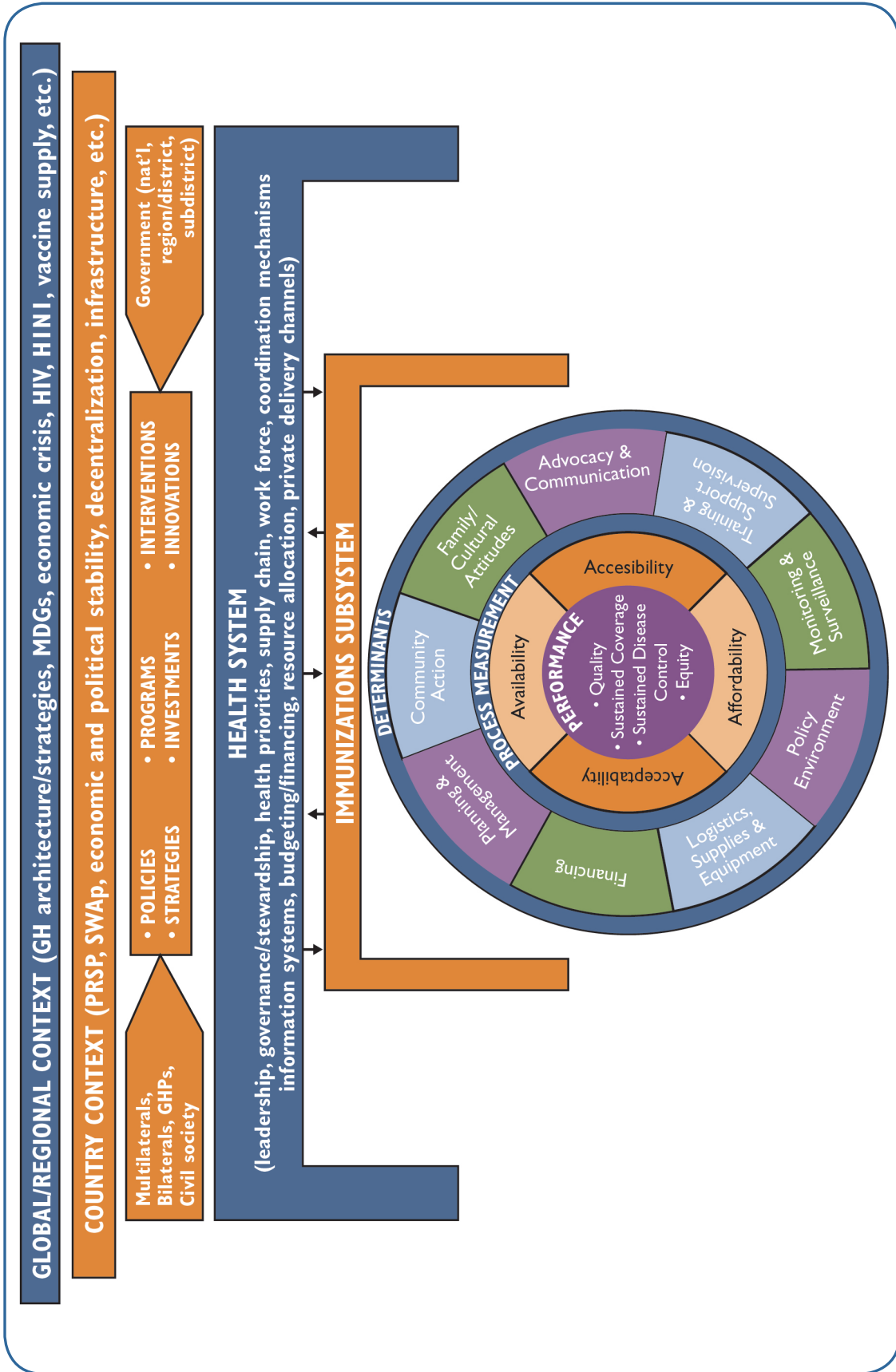
¹⁶ Université Catholique de l'Afrique Centrale (CUAC)

I.1 CONCEPTUAL FRAMEWORK

At the beginning of the project, ARISE defined a global conceptual framework for understanding the drivers of RI performance (Figure 1). This framework distinguishes four levels of analysis of potential RI performance drivers: the global and regional context, the national context, the health system, and the immunization subsystem.

The literature review conducted for the landscape analysis revealed few studies or concepts explaining the drivers of immunization system performance. An exception—Naimoli et al (2008)—studied success factors for RI in sub-Saharan Africa using the following categories: governance and institutional frameworks, management, strategy, mothers' demand, and funding. Thus, the notion of classifying potential performance drivers is not new. The ARISE study in Cameroon also adopted thematic fields or levels of analysis using an inductive approach based initially on interviews with key informants. It then built on field level exploration of drivers at the district level. Key terms and concepts employed by this study are defined in Annex I.

Figure 1. ARISE Conceptual Framework of Drivers of Routine Immunization System Performance



2. SITES, POPULATION, AND METHODS

2.1 DESIGN

The research took a comparative case study approach using both quantitative and qualitative methods for data collection and analysis. The research team conducted a comprehensive exploration of RI performance drivers and a comparative analysis to identify and analyze drivers in different settings. The cases were defined based on immunization coverage (Penta3). One of the first challenges at this level was the reliability of the statistical data on which the selection of health districts was based. Nationally defined coverage figures can be influenced by inaccurate population estimates. To operationalize the design, the study team also reviewed coverage data in each health district, consulted coverage reports from the 2004 Cameroon Demographic and Health Survey (DHS), conducted a sociological analysis of the EPI in the health districts, and held discussions with immunization and health experts in Yaoundé (National Statistics Institute and ORC Macro, 2004).

2.2 SELECTION OF HEALTH DISTRICTS

The initial selection of health districts was based on official reports of Penta3 coverage, discussions with immunization and health experts in Yaoundé, and other criteria specified in the ARISE study protocol. The team used a data set of health-district Penta3 coverage in 2007, 2008, 2009, and 2010 to create a list of all eligible health districts. Districts eligible for the study had to have the same boundaries and comparable data throughout the study period. Researchers selected three health districts whose data for the period showed increased performance in Penta3 coverage and one district whose data for the period showed steady coverage, with little change. The study team used the four years from 2007 through 2010 as the study's time frame for two pragmatic methodological reasons. First, the institutional memory of many district health services does not stretch back longer than three to four years. Second (and most important), lessons learned from recent performance improvement are most likely to be useful to other health districts in Cameroon and sub-Saharan Africa, because they reflect current political, health, social, and demographic realities.

The three health districts with improved Penta3 coverage from 2007 through 2010 that researchers chose to study were Kribi, Ndop, and Mbanga. They chose Bali as the health district whose coverage had remained steady during the same period. As fieldwork progressed, however, the team found evidence that coverage reports for Bali and Mbanga were inconsistent with the immunization program experience of those districts. Thus, after careful review of different data sources and fieldwork, including key informant interviews and record review, the research team decided to reclassify Bali as a health district with improved performance, exclude Mbanga from the analysis, and select another health district (Bafang) that met the stipulated criteria to represent the health district with steady coverage. Annex 2 presents the rationale for and steps taken in district selection.

2.3 SELECTION OF THE HEALTH AREAS

In each health district the study team visited 18 “health areas”—*l'aires de santé*, which are similar to health subdistricts. All health areas had to be rural and not sparsely population. Of these at least one had to include the district headquarters, two had to include health centers where Penta 3 coverage had improved, and one had to include a health center where coverage was steady and poor. Table 1 summarizes study selection criteria by study sites.

Table 1. Study regions, health districts, and health areas by selection criteria

SELECTION CRITERIA	Increased performance (reported administrative coverage)		Increased performance based on district investigation and expert consultation	Steady performance (reported administrative coverage)
HEALTH DISTRICT	Kribi	Ndop	Bali	Bafang
HEALTH AREA	<ul style="list-style-type: none"> • Urban Kribi • Grand Batanga • Londji • Elogbatindi • Adjap 	<ul style="list-style-type: none"> • Urban Ndop • Bamunka • Bafanji • Bamessing • Bamali 	<ul style="list-style-type: none"> • Urban Bali • Catholic Mission • Bossa • Bawock • Wosing 	<ul style="list-style-type: none"> • Urban Bafang • Bakou • Bana • Bab-Ngaleu-Mouankeu
REGION	South	Northwest		West

2.4 STUDY POPULATIONS

Interviews were conducted at central, regional, health district, facility, and community levels. Respondents were health directors, managers, and workers; community members, including clients and administrators; and development partners. Annex 3 summarizes the types of respondents interviewed.

2.5 DATA COLLECTION METHODS AND TOOLS

Data collection

The study primarily employed unstructured and semi-structured interviews with individual respondents to explore the immunization system context, immunization performance, and the drivers of performance. Free listing¹⁷ of the drivers of performance was conducted at the end of each interview. Researchers also conducted focus group discussions, systematic site observations, and home visits. Interview guides were developed for each type of respondent and study area. Tools were also designed to collect data from the health service

¹⁷ “Free listing” is an anthropological data collection method in which an informant is asked to list all the different kinds of some category (e.g., the factors that may impact RI system performance). “This method is used as a preliminary exploration of a ‘domain’ (a list of words or concepts in a culture which belong together). Delineating relevant domains is the means by which researchers understand a culture’s beliefs.” (http://www.jhsph.edu/bin/c/i/study_method.PDF)

records and reports found in district health offices and health facilities. The research team transcribed annual and monthly statistical data from 2007 through 2010, focusing on doses of Penta1, Penta3, and measles vaccine. Rates were calculated for coverage, left out (never vaccinated), and dropout. Another tool was employed to collect data on numbers and types of staff, refrigeration equipment, transportation resources, and program activities. Finally, an observation guide was used to collect additional data on the condition of infrastructure, equipment, registers, and refrigeration equipment.

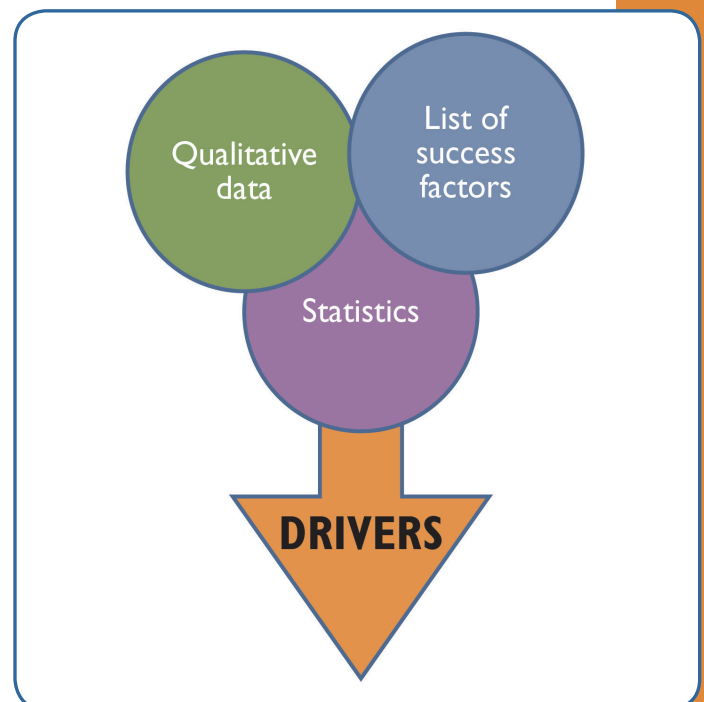
At the regional level the team interviewed the regional delegate and the EPI point person. Upon arriving in a district, the team conducted an initial session with district health officials (the head of district health services and the head of the health bureau) and their associates. In Kribi and Ndop, the team also met with administrative authorities.

2.6 DATA ANALYSIS

Quantitative data were entered into SPSS software for descriptive analysis and then exported to Excel for presentation of graphs depicting district-level immunization system performance. Qualitative data were analyzed for the purpose of free listing using ANTHROPAC software,¹⁸ which produces frequencies and ranking of potential performance drivers based on interview responses.

In the analysis of the free lists, drivers were grouped by central and health district level depicting the most frequent driver named. The entire set of text-based data—96 interviews and 58 other items, for a total of 154 observations—was then coded using the segment-coding software Ethnograph. Coded text was drawn from the database and grouped by health district and theme. Finally, the quantitative and qualitative data were integrated to elaborate on potential drivers and confirm their correct identification, and by explaining their links to performance. In the process of analyzing these data, researchers were able to define the notion of a performance driver more precisely and also to define common categories of drivers. Figure 19 and Figure 20 in Annex 4 illustrate the analysis steps and the process of constructing drivers. Figure 2 above summarizes the analysis process.

Figure 2. Key inputs for analysis and development of drivers.



¹⁸ ANTHROPAC is a free program for cultural domain analysis.

In summary, analysis leading to the identification of performance drivers involved thematic grouping, classification, and comparison with other data. Potential drivers were confirmed as actual drivers when their relationship to RI performance was proven. The relationship had to be supported by additional data (quantitative or qualitative) and a description of a micro-process, pathway, or coherent series of events leading to performance improvement.

The health district was designed to be the primary unit of analysis. In Cameroon, the health area was also a locus for analysis. Data from central and regional sources were analyzed to discern links to district-level performance drivers. Central and regional inputs may influence the processes that unfold in a district and the decisions that are taken there. Bali and Ndop are located in the same region and both experienced improved performance in recent years. In addition, the health district of Bafang shares many sociocultural characteristics with Bali.

3. THE CONTEXT OF CAMEROON'S EXPANDED PROGRAMME ON IMMUNIZATION

3.1 GEOGRAPHY

The United Republic of Cameroon covers 475,440 square kilometers. The country is located in Central Africa between the Gulf of Guinea, Equatorial Guinea, Gabon, and the Democratic Republic of Congo to the south and Chad to the north, Nigeria to the west, and the Central African Republic to the east. Due to this plurality of borders, refugee and migrant groups are often found in Cameroon. Cameroon has 10 administrative regions, 58 administrative departments, and 269 boroughs.

The natural environment in Cameroon is characterized by a great diversity of ecosystems that are generally classified into three distinct zones (see Table 2).

These geographic features are often linked to the country's frequent epidemics, such as malaria (the leading cause of consultations in health facilities); meningitis (in the north); endemic cholera, diarrhea, and acute respiratory infections in children; and parasitic diseases (trypanosomiasis, filariasis, intestinal parasites, schistosomiasis). Cameroon's HIV prevalence rate is among the highest in sub-Saharan Africa. Poliomyelitis, measles, and yellow fever are still significant threats.

The natural environment also restricts access to health services. Population movement linked to lifestyle (e.g., among pygmy populations and the Bororo and nomadic herders) or to broader socioeconomic and political dynamics (e.g., immigration, refugee flows, and border crossings) can affect immunization programs and services.



Table 2. Characteristics of zones and regions in Cameroon

ZONE	Forestry South	Northwest	Western High Plateau
REGIONS	Central, East, Littoral, South, and Southwest	Northwest	West
CLIMATE AND GEOGRAPHY	High rainfall, dense natural vegetation; river system; alternating wet and dry seasons	Highlands	Highlands with a mild climate and high rainfall; fertile soils, with terrain peppered by crater lakes created by volcanos
MAJOR CITIES	Douala and Yaoundé	Bamenda	Bafoussan and Dschang
STUDY DISTRICTS	Kribi	Ndop and Bali	Bafang

3.2 THE SOCIODEMOGRAPHIC CONTEXT

Cameroon's population is ethnically and culturally diverse, with more than 200 ethnolinguistic groups. Religious groups include Catholics, Anglicans, Protestants, and Muslims as well as followers of evangelical churches and traditional African religions. Cameroon's official languages are French and English and many local languages are spoken.

The 2005 census depicts a young population; more than half of the population as of that date was under 25 years old (50.5 percent of females and 49.5 percent of males). Just over half of the population (52 percent) resided in rapidly growing urban areas. In early 2010, the population was estimated to be 19.4 million. The annual average population growth rate was estimated to be 2.6 percent—a decline from the 2.9 percent growth rate estimated in 2005. Basic health statistics for Cameroon appear in Table 3.

Table 3. Basic health statistics

INDICATOR	DATA	SOURCE
Neonatal mortality	34 deaths per 1000 live births	UNICEF 2010
Infant mortality	84 deaths per 1000 live births	UNICEF 2010
Child mortality (under five)	136 deaths per 1000 live births	UNICEF 2010
Life expectancy	51 years	UNFPA 2009
Total fertility rate	4.6 children per woman	World Bank 2009
Antenatal care, at least one visit	82%	World Bank, 2006
Skilled birth attendance	63%	World Bank 2006
Urban population average annual growth (2001-10)	3.8%	World Bank
Literacy rate for adult women as percentage of men's literacy rate (2000-09)	81%	World Bank 2007

Source: World Bank (2012). Cameroon, all indicators. http://api.worldbank.org/datafiles/CMR_Country_MetaData_en_EXCEL.xls. Accessed 10 May 2012.

3.3 SOCIOECONOMIC AND POLITICAL CONTEXT

The World Bank categorizes Cameroon as a lower-middle-income country.¹⁹ It ranks 131 out of 161 countries in the United Nations Development Programme's Human Development Index. In 2009 per capita income was estimated at \$1,170. Average annual growth of gross domestic product (GDP) was 0.7 percent from 1990 to 2009, while the average annual rate of inflation in the same period was 4 percent. From 1994 to 2008, a third of the population was living below the poverty line (\$1.25 per day). Between 1998 and 2008, health accounted for 3 percent of central government expenditures.

Cameroon's economy depends on agricultural production, timber, minerals (including oil and diamonds), and industry. After a period of sustained growth, from mid-1980s to mid-1990s Cameroon experienced an economic crisis and underwent structural adjustment by the World Bank and the International Monetary Fund (IMF). In 2000, as a result of sound macroeconomic performance, Cameroon was admitted to the Highly Indebted Poor Countries initiative (HIPC) and introduced a program of poverty reduction. In 2003 the government and development partners invested in strengthening basic social services—mainly education and health. In 2003 economic growth reached 5 percent. Eventually the country was able to meet the conditions that allowed bilateral and multilateral debt relief. Debt relief enabled actual recruitment of 1,200 health agents in 2002 and 600 in 2004. And 2,400 more were recruited in 2007 thanks to funds from the HIPC initiative and the Council for Sustainable Development. In addition, measures were taken to improve the working conditions of health personnel. Nevertheless, in 2010, there were only 18.4 doctors for every 100,000 inhabitants, in comparison with the African average of 39.6 doctors for every 100,000 inhabitants (African Development Bank, 2009). Economic growth was 3.2 percent in 2010. Between 2005 and 2010, growth appeared to be driven mainly by revenue from the oil industry (accounting for half of Cameroon's exports) and agriculture (accounting for a quarter of the country's exports).

3.4 THE HEALTH SYSTEM

According to *Health Sector Strategy 2001-2015* (Government of Cameroon, 2011), the national health system comprises three subsectors:

- the public subsector, which is primarily the responsibility of the Ministry of Public Health, but includes health facilities supervised by other ministries (Defense, Labor, Social Security, Education, and National Security)
- the private subsector, which includes for-profit and not-for-profit services
- traditional medicine

The health system has three organizational levels:

- The central level includes the departments of the Ministry of Public Health (MOH) and that ministry's highest hierarchical structures.

¹⁹ Classified according to the World Bank Atlas Method. Available at <http://data.worldbank.org/about/country-classifications/country-and-lending-groups>.

- The intermediate level is primarily responsible for technical support of basic operations. It consists of ten Regional Public Health Delegations—one for each of Cameroon’s administrative regions.
- The operational level is represented by the 179 health district health services. Each health district is divided into areas served by integrated health centers. In some cases, these health centers are subdivided into operational units for conducting outreach, tracing defaulters, raising awareness, and social mobilization.

These three levels have distinct administrative structures, care facilities, and community structures. Table 4 depicts the system’s architecture.

Table 4. Levels and structures of the health system in Cameroon

LEVEL	National structures	Responsibilities	Care facilities	Local structures linked to health
CENTRAL	Ministry of Public Health	Concepts, policies and strategies ; coordination ; regulation	Reference hospitals, university hospitals, central hospitals, agencies under administrative supervision	Boards of governors or management committees
INTERMEDIATE	Regional delegations	Technical support to the health districts	Regional and other hospitals	Regional special funds for health promotion
PERIPHERAL	Health districts and services	Program implementation	District hospitals, district medical centers, health centers	District health committee, district management committee, health committee, management committee

Laws 2004/018 and 2004/019, passed in 2004, lay the foundation for decentralized local administrative offices at regional and borough levels and afford these offices the following important roles in health and social development:

- establishing, equipping, managing, and maintaining the health centers at borough and regional levels in accordance with the health map
- participating in the organization and management of drugs, other supplies, and essential medical operational devices, in accordance with the national health policy;
- organizing and managing support for poor people

In 2007, the MOH began strengthening public/private partnerships through contracting. The proportion of the government budget allocated to health remains low: less than 5 percent in comparison with the 15 percent commitment made in the Abuja Declaration.²⁰

3.5 IMMUNIZATION COVERAGE

Immunization coverage in Cameroon has grown steadily from 1980 onwards (see Figure 3). The most spectacular advances were made in the 1980s, during the global pursuit of universal childhood immunization (UCI). However, in spite of technical and financial support from UNICEF and others, UCI was not achieved and coverage fell in the early 1990s. Since then, Penta3 coverage has improved consistently, reaching just above 80 percent in 2010 (WHO/UNICEF, 2011).²¹ Looking back, one can see that the first decline in national immunization coverage corresponds with Cameroon's general economic crisis and structural adjustment, both of which affected health policies and health spending. Several other African countries experienced a similar decline following the period of intense investment in UCI. From 1990 to 1997, the MOH's share of the national budget decreased from 5.09 percent to 2.80 percent. The most recent decline in national coverage in Cameroon appears to correspond to the suspension in 2008 of the country's eligibility for Immunization Services Support (ISS) from the Global Alliance for Vaccines and Immunizations (GAVI), which until then had been a major external financial partner. It is likely that the increase

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

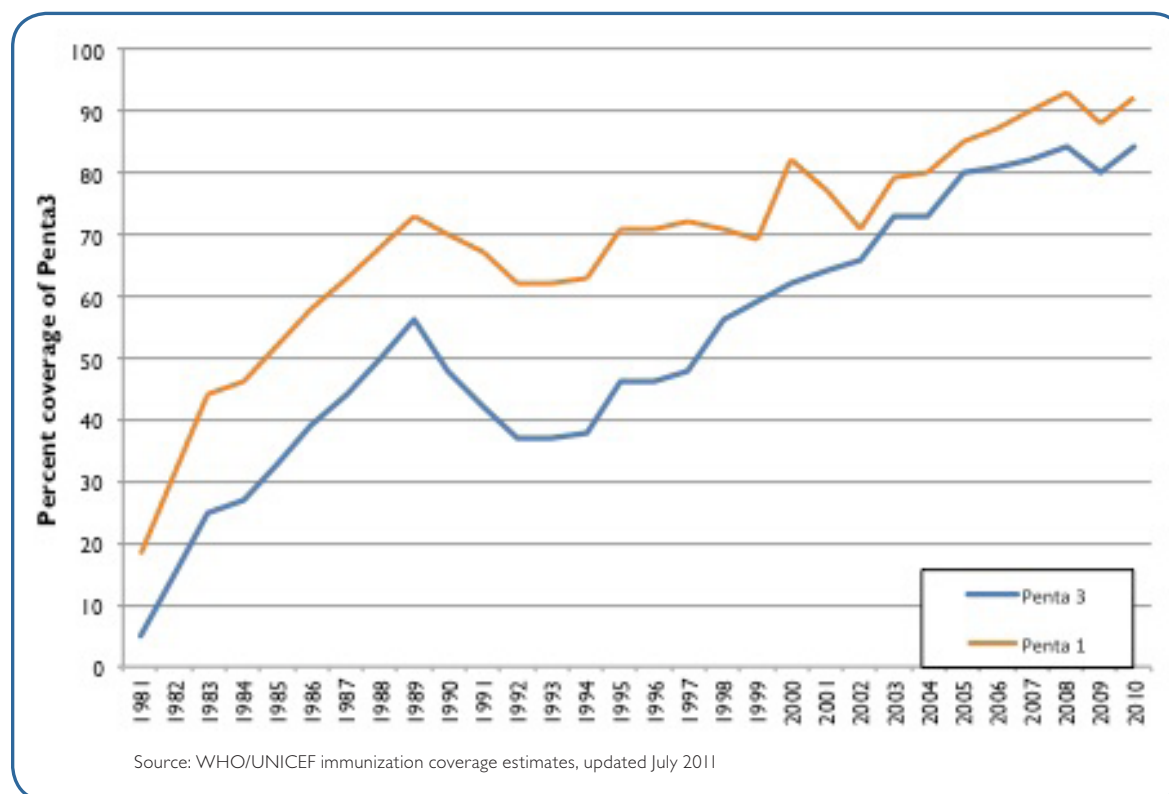
20 Abuja Declaration. www.rbm.who.int/docs/abuja_declaration.pdf. Accessed 7 February 2012.

21 Penta3 coverage was obtained from both national and district administrative reports and from WHO/UNICEF coverage estimates, updated July 2011.

in coverage observed in 2010 relates to considerable government involvement in activities to reach unvaccinated and under-vaccinated children and to reinstate performance-based funding from GAVI. Another indicator of performance is the equity of immunization coverage—the ratio of coverage between the highest and the lowest wealth quintiles. Between 1998 and 2004, Cameroon’s equity ratio improved significantly, shifting from 2.6:1 to 1.3:1.²²

At the district level, trend data indicate that the increase in national routine immunization coverage during the ARISE study period (2007 through 2010) began in 1995, possibly influenced by the new dynamic of community health construction and decentralization and supported by other investment in primary health care and steady support for building the immunization infrastructure. Thus, we hypothesize that many of the drivers that powered performance during the study period were present in some form before that period. As noted above, the recovery of coverage following suspension of GAVI ISS funding seems likely to have stemmed from the intensification of activities such as the Maternal and Child Health and Nutrition Week (SASNIM) and from programs and strategies implemented to fill the gap that the suspension created.

Figure 3. Trends in Penta3 coverage, 1981–2010



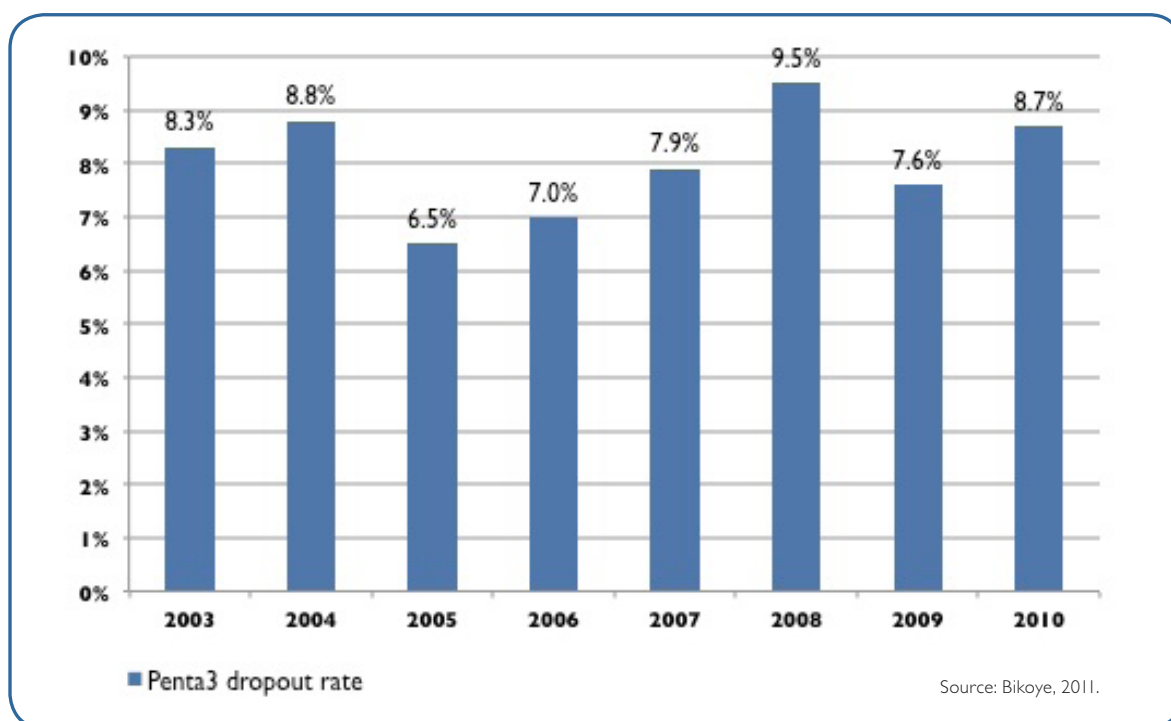
Box I contains a short summary of policies and events that the literature and key informants have identified as having played a role, historically, in the performance of the Cameroon EPI. It

²² Data drawn from Cameroon DHS 1998 and 2004. The equity gap was calculated as a ratio of DTP3 in highest wealth quintile/DTP3 in lowest wealth quintile as part of the ARISE landscape analysis.

offers offers a detailed chronology of these and other historical and contextual influences on the program. Highlights include:

- introduction of decentralized and community-based health care that focused on increasing access to health facilities at the community level
- adoption of WHO's RED strategy, which focused on strengthening the district's role in immunization, by emphasizing community mobilization, outreach strategies, and microplanning. (According to the 2005 evaluation of the EPI, RED started in 2002 and was extended to all health districts in 2005. The same evaluation noted that health districts implemented RED differently; health areas in some districts paid less attention than others to specific elements of the intervention. Reviewers reported that inconsistent application of RED may account for low coverage and high dropout rates in some areas.)
- access to and suspension of GAVI ISS (performance-based) funding and contracts with health districts (implemented from 2004 to 2005)
- steps taken to remedy coverage decline that focused activity on unvaccinated or under-vaccinated children (for example, SASNIM)
- initiation of support from UNICEF and WHO for health districts to implement the EPI
- development of a comprehensive Multi-year Plan (cMYP) (2007-2010), which set new targets for coverage: 90 percent nationally; 80 percent in all the health districts; and a dropout rate of 5 percent to 10 percent, depending on the antigen
- development of a plan for financial sustainability

Figure 4. Cameroon Penta3 dropout rate, 2003-2010

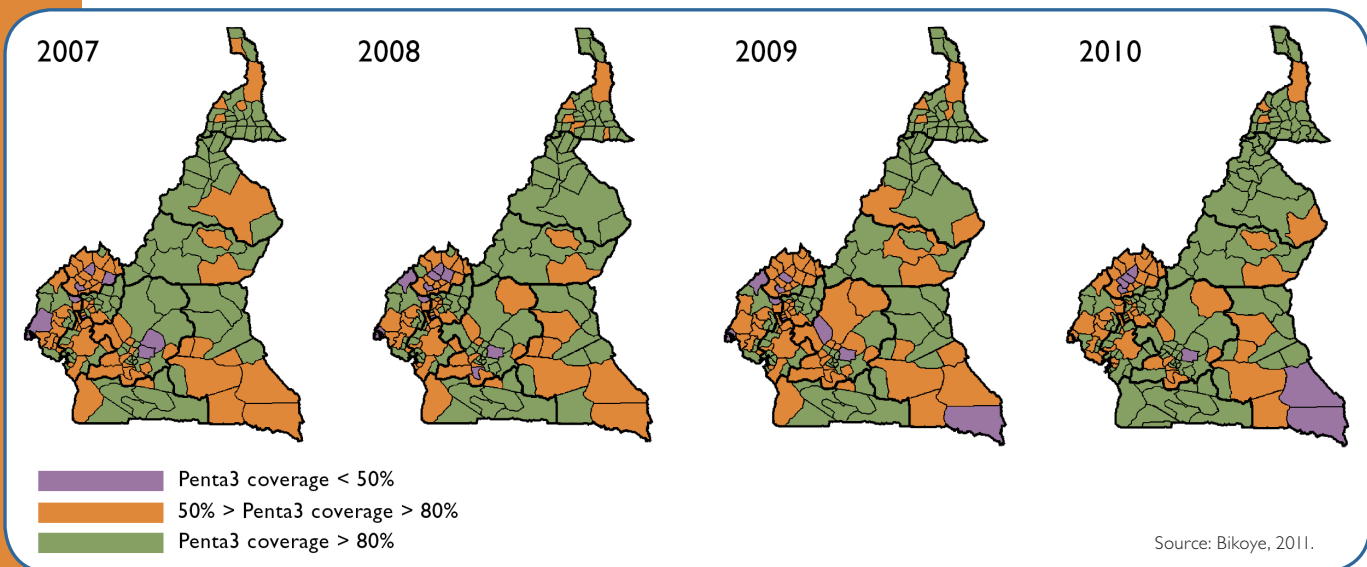


In spite of positive national trends in coverage, pockets of low coverage or slower growth in coverage remain (see Figure 4 and 5). Program statistics related to Penta3 dropouts suggest that the country has made significant progress in this area. The dropout rate is around 8 percent (the national goal) and below the 10 percent threshold that WHO uses as an indicator of a serious gap in service quality (Bikoye, 2011).

3.6 DATA QUALITY

Program managers and development partners generally consider Cameroon's immunization-related statistics to be reliable, although accurate population estimates for calculating coverage are often elusive for this country, as for many others. Immunization data were subjected to quality audits in 2001 and 2004. Coverage estimates for 2007 through 2009 reported to the study team for this study used denominator estimates that were extrapolated from an outdated population growth rate (1987 population census data; growth rate of 2.9 percent per year). For most of the study districts, the 2010 population estimates were drawn from the 2005 census, whose results were published in June 2010 (growth rate of 2.6 percent). As found in other African countries, many of these coverage estimates are inaccurate, because the denominator estimates do not take into account such local population dynamics as immigration, population displacement, variations in fertility rates, and infant mortality.

Figure 5. Maps of Cameroon Penta3 coverage by district (2007 through 2010)



3.7 THE STRUCTURE OF THE NATIONAL EPI

The structure of the EPI mirrors that of the health system: central level, intermediate level, and operational level. At the central level, the Central Technical Group of the Expanded Programme on Immunization (EPI-CTG), established in 2002, coordinates the program and works closely with the Inter-Agency Coordination Committee (ICC). The CTG is headed by a permanent secretary, who is assisted by a deputy permanent secretary. It consists of six sections: RI; supervision and monitoring and evaluation; logistics; social mobilization; additional immunization activities; and administrative and financial affairs.

At the intermediate level are the regional units of the EPI. These ten units are under the authority of public health regional delegates. The staff of the EPI regional units consists of a chief consultant, a computer manager, a logistician, a data manager, a store manager, an official in charge of communication, a secretary, and a driver for the staff car.

At the district (operational level), immunization is managed by a district team led by the head of district health services, who is assisted by a health bureau head of the district health office and a head clerk of the district's office of administrative and financial affairs (BAAF). The head of a district's health services collaborates with the heads of the integrated health centers. District teams work closely with health committees (COSAs) at the district level and with health facility management committees (COGEs) at the subdistrict level. These committees are coordinated at the district level by district health committees and district management committees. The health facility that is closest to the community is the integrated health center. Its staff consists of nurses, caregivers, and managers of medical stores.

4. IMMUNIZATION PERFORMANCE IN THE STUDY DISTRICTS

Figure 6 shows Penta3 coverage in the four study districts.

Figure 6. Penta3 coverage in four study districts and Cameroon national trend, 2002-2010

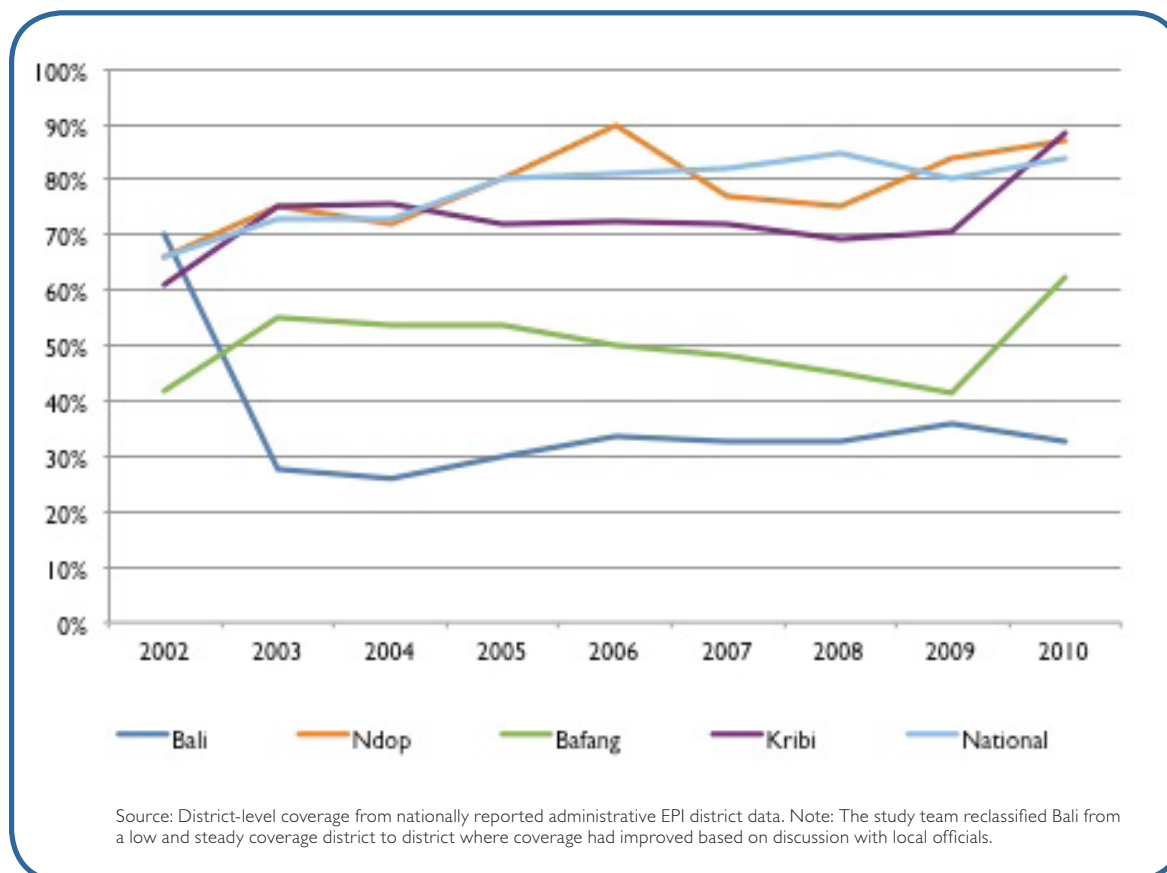


Table 5 compares districts by basic contextual characteristics, coverage, and selected indicators of immunization system capacity. In the past ten years, the districts with recent improvements in coverage have seen a greater increase in the number of facilities providing immunization services than in the steady coverage district (Bafang). The ratio of the vaccinator to target population is lower in Bafang than in the other districts. In other aspects of capacity, the districts appear similar. For example, vaccine availability in all districts was reliable, with only one three-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 subdistrict level.

Table 5. Contextual and coverage characteristics of 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 Pental and Penta3 in 2007 and 2010	14%; 18%	3%; 3%	11%; 3%	2%; 5%
Ratio of vaccinators to target pop., 2010	1:121	1:91	Not available	1:226
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 Penta3 coverage in Bali in 2010 at approximately 75 percent.

4.1 KRIBI HEALTH DISTRICT

Based on district administrative reports, Penta3 coverage in Kribi health district increased from around 60 percent in 2002 to 75 percent in 2003 and coverage was sustained at that level, with some variation, until 2009. Between 2009 and 2010 Penta3 coverage increased from 75 percent to 87 percent. Between 2007 and 2010, reported Pental coverage rose from 83 percent to 107 percent. The dropout rate for the same period is reported as 14 percent in 2007 and 29 percent in 2009, dropping to 18 percent in 2010. (See Figure 7 and Table 6).

Figure 7. Trends in Pental and Penta3 coverage in Kribi, 2007-2010

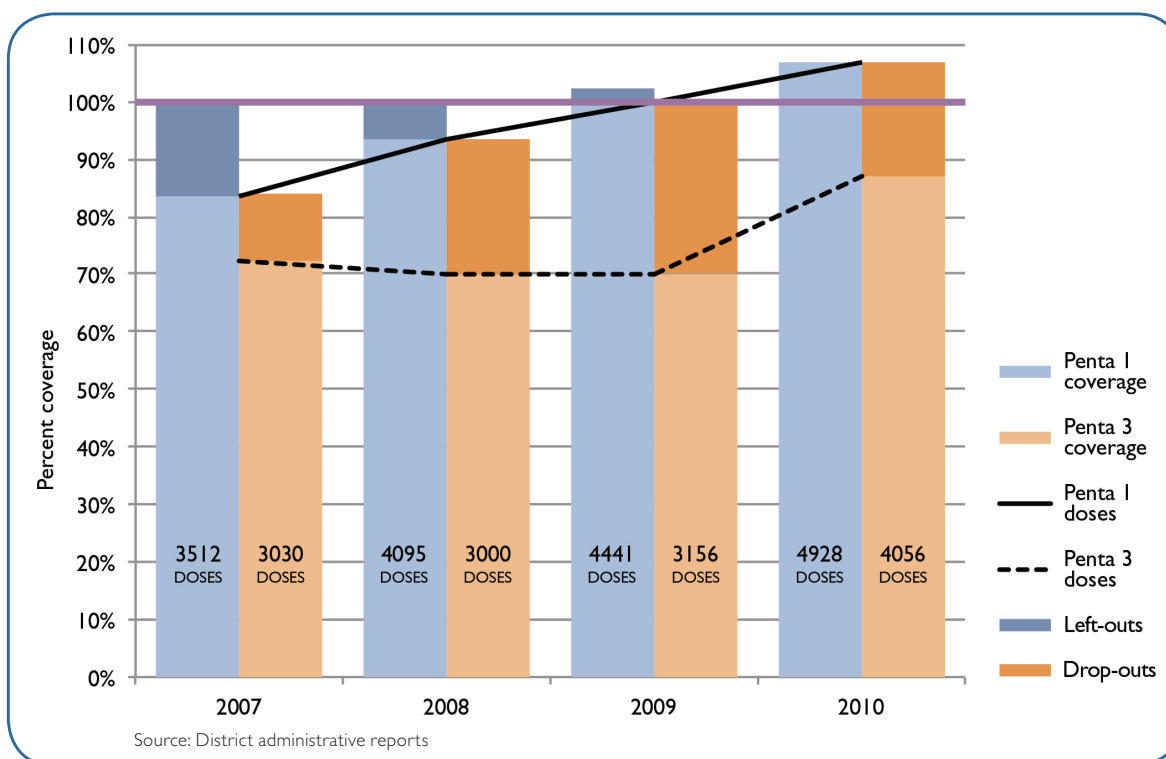


Table 6. Population and dropout trends in Kribi health district

	2007	2008	2009	2010
Total population	105,505	108,565	111,714	114,952
Target population (under one year)	4,220	4,343	4,469	4,598
Dropout rate	14%	27%	29%	18%
Penta3 coverage (%)***	78%	65%	84%	95%
Pental-3 drop-out (%)****	7%	12%	10%	4%

Source: District administrative reports

The Kribi health district covers about 8,325 square kilometers. This area has high rainfall, zones of equatorial forests, a dense river system, and poor roads that restrict movement. The main economic activities of the population are agriculture, hunting, and traditional fishing. The district also has a modern economic sector that is mainly composed of agro-industrial companies, wood processing companies, fishing and aquaculture industries, and tourism. The area is ethnically diverse—home to Pygmies, Batangas, Boulous, the Ngoumba, the Fang, the Mabi, the Bakoko, the Bassa, and the Ewondo. Several local languages are in use.

Kribi’s topography makes it challenging for health staff to reach rural areas. Coverage is generally higher in urban areas, with one exception: Adjap, a rural area that boasts higher Pental coverage than other areas. Adjap’s strong performance may be linked to the intensification of outreach strategies and to the attractiveness of the integrated health center among communities that lack health facilities. As noted by the head clerk of the Kribi’s health office, “We use outreach strategies; it is the only solution. We implement outreach strategies each month by motorcycle. If health workers do not have a motorcycle, they rent one.” Outreach was also employed for reaching marginalized populations, such as in Grand Batanga, where there was some resistance to vaccination among the Baka related to taboos around bloodshed and the likening of immunization to bloodshed. A respondent reported: “Here in Kribi district, the pygmies used to say that immunization causes injuries; that it makes blood flow and causes wounds. But now, many accept that their children be immunized.”

Figure 8. Trends in Pental and Penta3 coverage in Ndop, 2007-2010

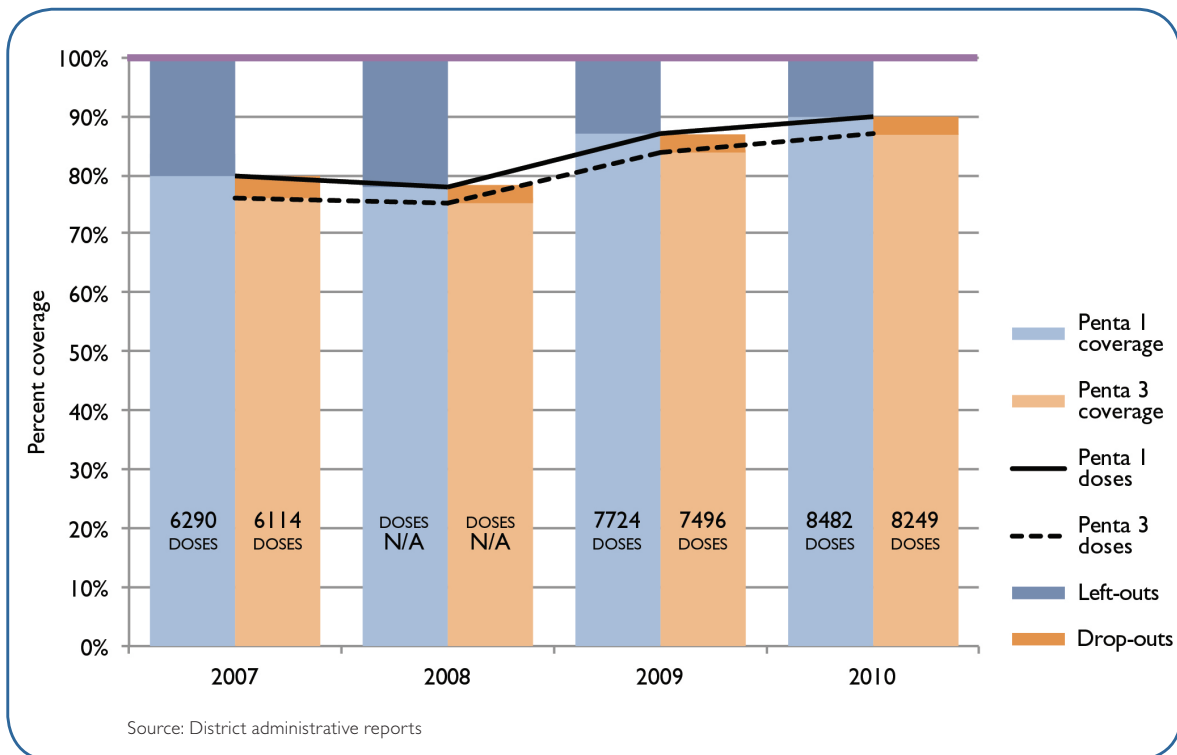


Table 7. Population and dropout trends in Ndop health district

	2007	2008	2009	2010
Total population	218,505	224,841	231,361	197,215
Target population (less than one year)	8,740	8,994	9,254	7,889
Dropout rate	3%	N/A	2%	3%

Source: District administrative reports

4.2 CONTEXT AND PERFORMANCE IN NDOP HEALTH DISTRICT

Ndop health district reported consistent improvement in Penta3 coverage from 2002 (65 percent) to 2006 (90 percent). There was a small decline in 2007-2008 and a recovery in 2009-2010. In contrast to Kribi health district, the Penta3 dropout rate in Ndop is small (3 percent). (See Figure 8 and Table 7).

Ndop health district (Northwest Region) is located 43 kilometers from Bamenda, the region's capital, and covers 1,115 square kilometers. The plain of Ndop consists mainly of savannah surrounded by highlands. Road access is challenging during the rainy season. The district is mainly rural (90 percent) and agriculture is the most important economic activity. Ethnic groups are the Tikar, the Chamba, the Bamileke, the Bamoun, the Yamba, the Fulani, and the Hausa.

4.3 CONTEXT AND PERFORMANCE IN BALI HEALTH DISTRICT

As noted above, the Bali health district was initially selected for comparison as the district where coverage had remained steady from 2007 through 2010. When the team arrived 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 home visits for spot checks of children's immunization status. These investigations, as well as in-depth interviews and observations, depicted Bali as a health district with stable but high immunization coverage and well-functioning program activities.

Figure 9 and Table 8 below represents data using the official denominator, and thus reflects the reported lower coverage level. The text following this graph describes the denominator challenge found in Bali, and highlights how both under- and over-estimation of denominators continue to pose acute challenges to immunization programs. The denominator problems found in Bali are comparable to those found in many countries in sub-Saharan Africa.

The discrepancy in coverage estimates appears to have resulted from the use of population figures from 2003 through 2010 that reflect a significantly larger population than is actually present. In Bali, there is considerable local sensitivity surrounding population estimates. Respondents confirmed that a local census conducted within the previous five years for the purpose of health planning had estimated the total population of Bali at around 20,000 and

a second estimate using adjusted growth rates place the population at 35,000. The official population estimate used to calculate immunization coverage was around 70,000. Local traditional leaders rejected the lower population figures as a political attempt to reduce the power of certain local groups. However, the official reports of immunization coverage appears too low when using the higher official estimate. Support for the notion that Bali's coverage is much better than the official estimate suggests comes from field observations and reports from respondents that immunization is well accepted among the citizens in Bali and that immunization services are delivered effectively, even to people in remote areas. Moreover, overall access to health services in Bali is reported to be one of the highest in the country, because of the extensive support from emigrants who channel resources to the health sector from abroad.

Figure 9. Trends in Pentavalent and Pentavalent 3 coverage in Bali health district, 2006-2010

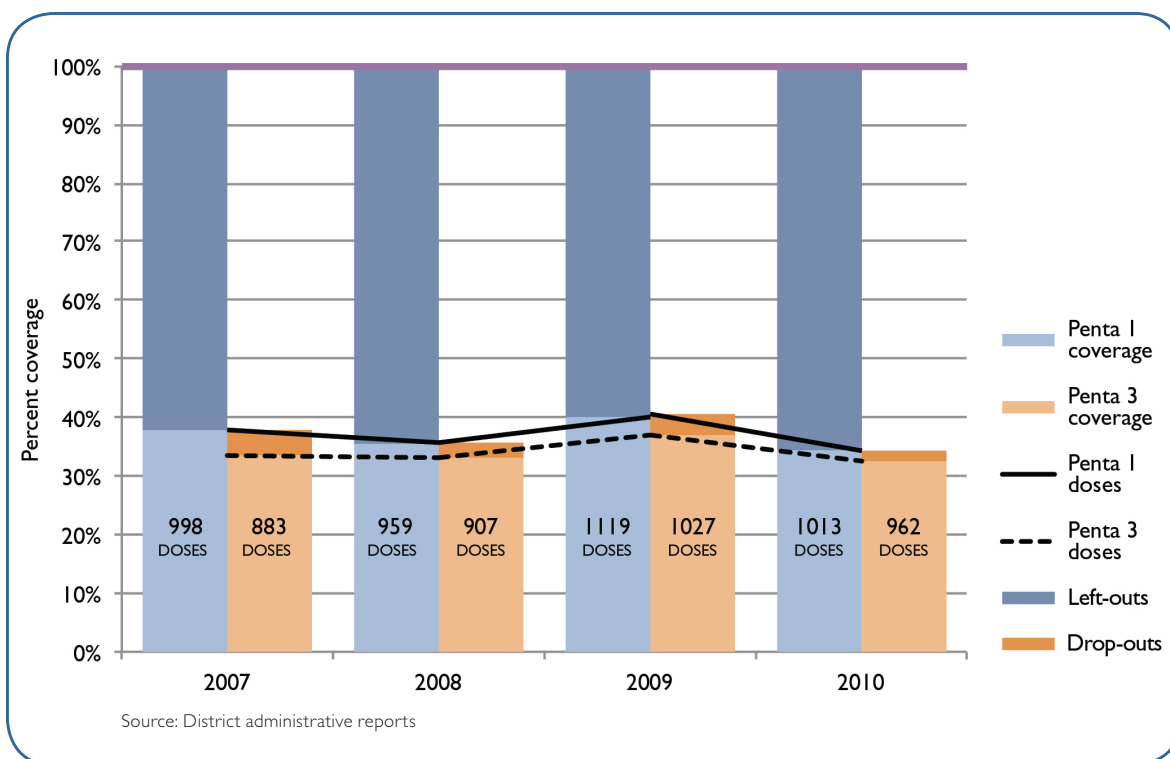


Table 8. Population and dropout trends in Bali health district, 2006-2010

	2007	2008	2009	2010
Total population	67,564	69,524	71,540	73,614
Target population (less than one year)	2,703	2,781	2,862	2,945
Dropout rate (%)	11%	3%	8%	3%

Source: District administrative reports

Based on these findings, the study team changed Bali's classification from a "steady" coverage district (reflecting no performance improvement) to an improved coverage district. Bali appears to be a district that achieved high immunization coverage prior to the study period and where coverage stayed high thereafter.

Bali health district, a highland area in Northwest Region, covers 240 square kilometers. Population density is high (266 inhabitants per square kilometer) and out-migration is common. The main ethnic groups are the Chamba, the Widikum, and the Bamileke. Ethnic tensions are frequent, and in the past, conflicts have led to population movements. Bali has many cultural associations (for example, of women, men, and youth) and there are two active nongovernmental organizations (NGOs)—Cameroon Friends for Rural Development and Rural Development of Bali. The Friends organization has built and equipped many facilities in the district.

The people of Bali are and remain strongly attached to their culture and traditional institutions. Traditional leaders play an important role in local decision making. The Prince in Bali reports that he has been designated the representative of the supreme traditional authority (the Fon) in the health committee, on which he serves as president. The Prince said he has developed close relationships with citizens of Bali who live abroad, especially those in the United States and Germany. These citizens have in turn succeeded in mobilizing international NGOs to provide such resources for the health sector as buildings, modern equipment, medicines, sanitation equipment, electricity, and drinking water supply technology. The Prince has also encouraged local organizations such as Kumo Fede to invest in improving health conditions. Currently, each health area has a health committee that serves as the intermediary between the health system and the community, mobilizes people for outreach services, and traces defaulters.

4.4 CONTEXT AND PERFORMANCE IN THE BAFANG HEALTH DISTRICT

When Bali was reclassified, the team added Bafang health district (Western Region) to the study to serve as the example of steady coverage from 2007 through 2010. Between 2002 and 2003, Penta3 coverage in Bafang increased from 42 percent to 54 percent and remained relatively constant until 2006. From that year until 2009, coverage declined to around 40 percent. A rapid increase in coverage occurred between 2009 and 2010. (See Figure 10 and Table 9).

Bafang health district is located in the Haut-Nkam department of Cameroon's West province—the smallest of the provinces and one of the most densely populated. The Haut-Nkam department covers about 958 square kilometers, and the town of Bafang serves as the department capital. The main economic activities of the population are commerce, trading, and agricultural production, which includes subsistence crops (maize, for example) and cash crops (coffee, cocoa, rice, tea, and tobacco) (Delancy et al, 2010). The majority of the inhabitants of the West province are semi-Bantu or grasslands Bantu people either of Bamileke or Bamum origin.

Respondents reported that some religious and traditional communities in the district oppose immunization. Bafang health district appears in the analysis of qualitative data as strongly marked by the existence of isolated areas, even though isolation alone cannot explain the integrated health centers' poor performance. Coverage is lower than in the other study districts, both for Pental and Penta3, though Penta3 has begun to improve. The population of Bafang is the second largest of the four study districts. Health staff in Bafang explained that the large population made it difficult to reach all the children. Figures confirmed that coverage in the rural areas served by integrated health centers was lower than in other areas.

Figure 10. Trends in Pental and Penta3 coverage in Bafang health district, 2007-2010

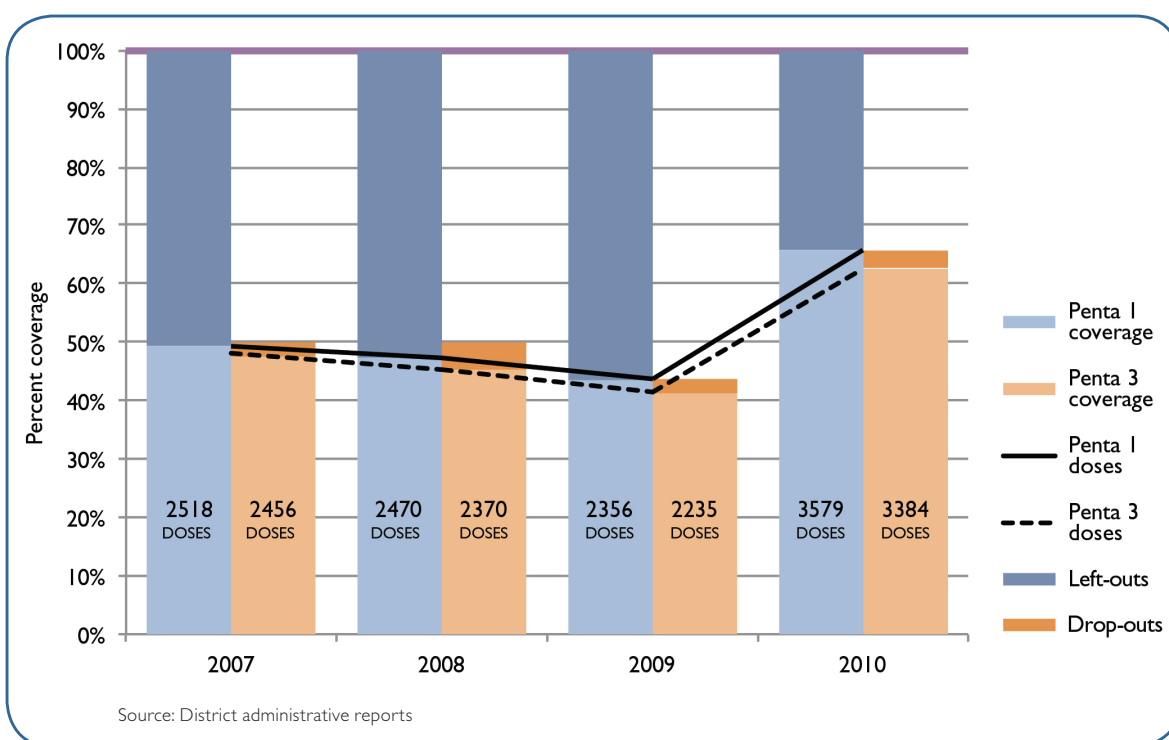


Table 9. Population and dropout trends in Bafang health district, 2007-2010

	2007	2008	2009	2010
Total population	127,250	130,941	134,738	135,646
Target population (less than one year)	5,090	5,238	5,390	5,426
Dropout rate	2%	4%	5%	5%

Source: District administrative reports

5. CONSTRUCTION AND FRAMING RI PERFORMANCE DRIVERS

The identification and exploration of RI performance drivers involved several steps. As noted in Section 2, free listing was used to capture respondents' perceptions and experience with RI performance drivers. These free lists provided the preliminary concepts and terminology for understanding RI performance drivers and were the basis for initial coding of the qualitative data. Following free listing, drivers of RI performance were identified through several stages of analysis: content analysis (theme identification, reference to empirical data, axial coding, and taxonomic analysis), triangulation, and cross-checking against the quantitative data. These steps were followed by final classification of drivers and hypothesis testing. Finally, the team compared the driver experience of districts where coverage had improved (Kribi, Ndop, and Bali) with that of the district with steady coverage (Bafang). Results are reported below and details are presented in Section 6.

5.1 FREE LISTINGS OF POSSIBLE PERFORMANCE DRIVERS

To begin analyzing possible drivers of RI system performance, the research team constructed lists of plausible explanations for improved coverage derived from interviews with respondents at all levels of the health system. These lists were analyzed using ANTHROPAC software, which counts the recurrence of similar words to assess the frequency with which they appear in textual data sets, ranks the words, and gives them a saliency score.²³ A total of 53 free response lists were collected and analyzed. Twelve lists were collected centrally and 43 at the district level. Annex 5 offers the complete report of the driver concepts identified in the free listing exercise.

At the central level, political will was mentioned most frequently (66.7 percent); it also had the highest salience score (0.576). Training, planning, coordination, partner support, the availability of vaccines, supervision, SASNIM, and performance contracts were the nine items most frequently mentioned. Each of these items also earned a high or average rank and salience score. Community mobilization was, on average, ranked as the second most important driver.

In the study districts, awareness-raising, availability of staff, health worker behavior, availability of the vaccine, planning, monitoring, community mobilization, reception at the health facilities, and staff commitment ranked among the most frequent and salient responses.

Drivers of performance may not be perceived in the same way at central and district levels. At the central level, many of the items mentioned related to political will and general immunization program strategy. At the district level, respondents more frequently noted drivers related to service quality and support, which were not mentioned at central level.

²³ The Smith's saliency score (Smith's S) calculated by Anthropac is a frequency count weighted inversely by the rank of the item in each free listing. In practice, Smith's S tends to be very highly correlated with simple frequency. From Anthropac : <http://www.analytictech.com/borgatti/etk2.htm>

Table 10. Free listing of performance factors mentioned exclusively at the central or district level

CENTRAL LEVEL	DISTRICT LEVEL
Service integration	Weighing of children
Political will	Raising local resources
Advocacy	Involvement of the private sector
Support from international partners	Style of work
RED approach	Follow-up of children
Multisectoral approaches	Follow-up of pregnant women
Availability of human resources	Behavior of health workers
Governance	Financial autonomy of the health centers

5.2 IDENTIFICATION OF RI PERFORMANCE DRIVERS

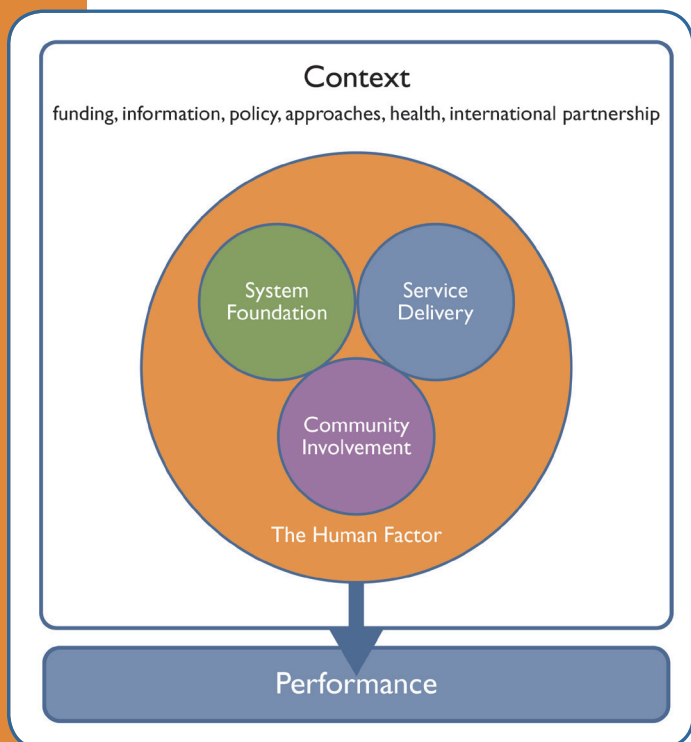
In total, researchers identified 23 mechanisms that improved RI performance at the district level. These examples of specific actions, policies, or resources that influenced performance were grouped into nine overall performance drivers that were common to the districts where coverage had improved and 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 11). 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). It also covers 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.

- The catalytic forces deemed *Human Factors* are woven throughout the other domains. They relate to the human behavior or characteristics that shape each domain and enable

Figure 11. Organizing framework for RI performance drivers in Cameroon



drivers within them to work effectively. The human factors include technical and professional competence that influences the design, management, and delivery of services; gender and gender roles; the extent of participation of communities; the degree of transparency in human and institutional interactions; and the motivation of service providers and community actors.

External influences on drivers and performance outcomes are also represented in Figure 11. They include factors such as global and national strategies and policies, legal frameworks, financing flows, and partnerships.

Table 11 summarizes the RI performance drivers and mechanisms that were common to all the districts where coverage improved and were absent or weak in the district with steady coverage.

Table 11. 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

24 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>).

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
		Transportation
	Community Involvement	Communication
Routine communication		
Additional communication channels		
Stakeholder Involvement		Linked health and community structures
		Involving local authorities
		Involving community-based organizations
Community Ownership of Immunization		Social acceptance of immunization
		Integration of immunization into local the culture
Human Factors (Catalyst)	Health Workforce Capacity	Technical skills of health and community workers
		Health worker behavior
		Social capital ¹⁵
	Social Inclusion	Gender approach (women-focused)
		Participatory approach
	Motivation	Recognition

6. ANALYSIS OF RI PERFORMANCE DRIVERS

This section presents each of the nine drivers of RI performance found in Cameroon, discusses and illustrates the drivers' links to improved RI performance, and presents the role of human factors as a catalyst for performance improvement.

6.1 DOMAIN: SYSTEM FOUNDATION

Within the system foundation domain, there are three main performance drivers:

- strategic approach of the immunization program
- implementation resources
- management systems

Table 12. summarizes the mechanisms of each driver within this domain.

Table 12. System foundation domain: Drivers common in districts with improved performance and their mechanisms

DRIVER	MECHANISMS	DESCRIPTION
Strategic approach	Stakeholder commitment	Leaders and managers taking personal and collective responsibility for improving RI performance
	Defining the strategy	Adaptation of global strategies to specific settings
	Knowledge of local situation	Sound knowledge of local conditions and needs
Resources for implementation	Availability of human resources	Number and distribution of human resources
Management systems	Performance review meetings	Alignment of plans and activities and sharing information at different levels
	Data management	Steps to improve the quality of data

6.1.1 DRIVER: STRATEGIC APPROACH

Drivers of RI performance within the strategic approach category were expressed in three ways: through widespread stakeholder commitment to immunization; through the choice and adaptation of specific strategies to reach immunization program goals; and through the acquisition and application of local knowledge to strategic planning and implementation for immunization programming. These three driver mechanisms often worked in concert at the central, regional, district, and service delivery level. It was rare to find a single driver acting alone to influence performance.

Stakeholder commitment

Respondents reported that **stakeholder commitment to the EPI at all levels of the system** was critical to performance improvement. Policy documents and plans contain monetary pledges (including allocating a share of the budget to the EPI) and program targets, and influential actors often confirm the government's commitment to improving national immunization coverage. The Minister of Health often states that immunization coverage is a critical indicator of national development and of Cameroon's progress toward reaching the United Nations Millennium Development Goals (MDGs). Public statements of commitment are backed up by operational links, which one respondent described as "direct communication lines between the minister and the EPI central team that are used to resolve potential problems and track progress." Similar examples of personal involvement of leaders are found among lower level authorities at the regional and district levels. In Kribi, the head of health services gave researchers an example of government commitment to immunization, stating that immunization was an "absolute priority" that is monitored closely:

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; that would be unpardonable.

Health staff in Ndop and Kribi reported that the nurses worked hard and carried out the tasks they had been assigned because the district's chief consultant had made immunization an absolute priority. The pathway to performance—starting with stakeholder commitment and ending with 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.

Strategies

The second manifestation of this driver comes in **the choice and adaptation of specific strategies** related to the immunization program at national, regional, and district levels. Strategy choice has been described by various actors as a powerful driver that supports coverage improvement. Historically, key national strategies that have been linked to improvements in the immunization program include: (1) increased national funding for vaccines; (2) strengthening the visibility of the EPI; (3) decentralizing the EPI by setting up regional units; (4) annual work planning; (5) devoting a budget line to the purchase of vaccines; (6) securing financial and technical support from development partners; and (7) implementing the RED approach.

In a number of interviews, respondents indicated that the RED approach triggered important changes in the way that services are planned; the methods for follow-up with families; communication; and resource mobilization (including human resources), especially from the community (see Box 2). At the regional level, improved performance was linked to the implementation of global and national strategies that were tailored to local service provision. For example, Reaching Every District began to be called "Reaching Every Child," which built local ownership and increased immunization activity in the Northwest Region. The Northwest regional delegate explained:

The RED approach was among the factors that improved coverage. But I used to talk about REC: Reach Every Child....Designating “Red Districts” and “Green Districts” to refer to districts with high immunization coverage and to those with low immunization coverage did not seem to me to be operational enough. We have appropriated those labels to differentiate the unvaccinated children from those who have received all their vaccines (“red children” and “green children”), and for the latter, emphasis had to be placed on raising awareness.

Box 2. The Reaching Every District (RED) Approach

Implementing RED in 2002 and extending it in 2005 to all the health districts in the country were two significant milestones for immunization policy and strategy in Cameroon. The RED approach was adopted at an historic moment, when immunization coverage had begun to recover after a short decline that was associated with the socioeconomic crisis of the 1990s.

Key informants from the central level indicated that the five components of the RED approach provided a foundation on which many other decisions and choices around immunization were made. The RED approach has five core components:

1. planning activities at the micro level and managing the available resources efficiently
2. implementing outreach strategies on a regular basis
3. monitoring training
4. making evidence-based programmatic decisions (for example, the use of schedules for follow-up activities and actively researching which children have missed their remaining immunization appointments)
5. strengthening relationships with the community

In the Northwest, which includes Ndop and Bali, other regional strategies that were adopted include:

- registering all pregnant women and following up for child immunization
- ensuring sufficient availability of refrigeration equipment and logistics services, beginning with priority zones
- involving the private and faith-based health providers
- ensuring that health staff are aware that they are responsible for vaccinating all children: “We should run after the children instead of running after the statistics.”

At district level, in Kribi, specific strategies focused on:

- improving data quality through recruiting staff with appropriate data skills
- reaching marginalized groups by extending immunization to low coverage areas
- involving private and faith-based providers

Local knowledge

The third element related to the strategic approach driver is **gaining and then applying knowledge of the local context to strategy development**. In the districts where coverage improved, the managers and health staff used local knowledge in several ways to ensure effective service delivery. Knowledge might have been gained through tracking eligible children using a local birth registration system or through the experience of working with community members and clients. Three examples follow:

1. The health officials of the Northwest region and of Bali health district explained that birth registration and defaulter tracing—key elements of their strategy—begin as early as a woman's first antenatal consultation. The health worker's personal rapport with the woman allows her to learn about the woman's situation and needs, and to win her trust. The health workers also keep records of all the pregnant women within their zones and follow up with the women to encourage them to begin immunization soon after their children are born.
2. In Ndop, the chief consultant realized that the nomadic pastoralist populations—Bororos and Haoussas—did not take part in SASNIM and decided to extend the event by one day to give these community members time to participate.
3. The chief consultant of Kribi health district reported: *In 2007 when I arrived here, I took time to gain good knowledge of the health map of the district, while taking into consideration not only the integrated health centers but also private health centers, industry-based health services, and faith-based health centers. Then I tried to see how these providers could participate in our immunization efforts. After that, we have involved them in practically everything we are doing in this field.*

6.1.2 DRIVER: IMPLEMENTATION RESOURCES

The second driver in the system foundation domain relates to the **resources required for immunization service delivery**. Among the different aspects of this driver that emerged in all districts (human resource availability; capacity building of managers and service providers; financing for immunization; and optimizing the use of resources through integration), the only common element among districts with improved coverage was human resource availability. Both the overall quantity of human resources and their distribution were reported to contribute to positive changes in coverage.

Human resources

The overall number of staff devoted to immunization is noted in the most recent cMYP (2007-2011). The EPI has 116 staff working full time: 56 in the central technical group and 60 in the regional EPI units of the 10 public health delegations. In the 174 operational health districts and in the health centers that provide vaccination, most health workers contribute in some way to the provision of immunization services.

Data on human resources over time were not systematically available in all study districts. Nevertheless, it appears that the overall number of health workers who supported vaccination

services with supervision, coordination, and administration in 2010 does not play an important role in coverage improvement or stagnation. At the level of the integrated health center, various types of staff are involved in vaccination: nurses, nurse's aides, and formulary clerks, some of whom are paid either by the boroughs or from community resources. Across the four study districts, however, there are notable differences in the definition of a “qualified vaccinator.” In Ndop and Bafang, the qualified vaccinators are the male and female nurses. In Kribi, community health workers are also trained to provide vaccinations.

As noted in Table 13 below, the estimated ratio of vaccinator to target population was higher in two of the districts with improved coverage than in Bafang, the steady performer. For comparison, in 2010, the ratio of qualified vaccinator to infants in Ndop was one to 91; for the same year in Bafang, the ratio was one to 226—a more than two-fold difference. Bafang also showed a marginal decline over time in the ratio of qualified vaccinator to infants, from one vaccinator per 217 infants (2007) to one vaccinator per 226 (2010). The ratio of vaccinator to target population in Ndop and Kribi improved during the period under study (2007 through 2010). In that period, Ndop recorded an increase in vaccinators because of increased community involvement. The same steps to increase the number of service providers appears in more limited scope in Kribi health district. As a result of cooperation with the borough authorities, the district was able to increase the number of vaccinators in the integrated health centers.

The evidence also points to the importance of the strategic distribution of health workers. In Bafang health district (with steady coverage), some health centers operated for several months without any chief consultant. In Kribi health district, the potentially negative effect of gaps in the overall number of staff is mitigated by an outreach strategy that distributes staff to areas of need. Kribi has also invested in additional staff at district headquarters to build technical capacity in areas such as computer literacy and data management. Community funds were also used to hire a statistician.

Table 13. Ratio of qualified vaccinators (infants) to target population to, 2007-2010

DISTRICT	2007	2008	2009	2010
Bali	NA	NA	NA	NA
Ndop	1/114	1/117	1/107	1/91
Kribi	1/140	1/145	1/143	1/121
Bafang	1/217	1/216	1/218	1/226

*Data from Bali is not available due to data quality concerns.

6.1.3 DRIVER: MANAGEMENT SYSTEMS

Within the management systems driver, two mechanisms influenced coverage improvement in Kribi, Ndop and Bali: performance review meetings and data management.

Performance review meetings

Team meetings at the central, regional, and district levels are valuable opportunities for sharing results, reviewing data, troubleshooting problems or challenges, and collaborating across health centers and levels of the health system. At each level, meetings are held on a regular basis to plan, review performance, and support health staff. In the past, the regions were given an allowance of 10 million Cameroon francs (CFA) to hold quarterly meetings, but the funds were later withdrawn for fiscal reasons. In the study districts where coverage had improved, however, review meetings (as well as training meetings) were common and held more frequently than in the steady coverage district. Respondents reported that these meetings made an important contribution to improved immunization performance.

At regional level, respondents reported that the intent of the meetings is to review data and results, and identify and support districts that are facing challenges. They also provide opportunities to exchange experiences across districts and build communication channels among colleagues. At the district level, respondents reported that data review during meetings is used to identify weaknesses and find ways to address them. District meetings are usually held once every two months. The health areas that are served by integrated health centers hold monthly meetings to review the annual work plan and report progress to the heads of health centers and community representatives. The administrative authorities of the health districts are often involved in these coordination meetings.

Data management

The national health information system extends to the health area. National policy documents spell out the importance of data collection and use in immunization. For example:

One of the first elements [of the immunization program] is data collection on a daily basis by listing and reporting on forms what is being done. On the 5th of every month, the immunization report for each area that is served by an integrated health center must reach the district headquarters. The district then prepares its monthly report. This report must reach the region by the 10th of the month and the region must forward these reports to the central level by the 15th.

In Ndop and Kribi, officials said that one of their first tasks on taking up their positions was to improve data entry procedures. They reported that this step enabled to district to avoid huge data losses that had previously distorted district-level coverage estimates.

To guide programming, the Bali health district conducted its own census to confirm the denominator estimates provided by the national statistics office. A local respondent reported:

[We created registers in each quarter and village.] The records were kept by the heads of quarter.

In each health district, there was a person in charge of awareness raising and mobilization who helped with the census. This painstaking work allowed us to gather highly reliable data on the number of children and pregnant women. But to our great surprise, the administrative authorities asked us not to use the figures from our census, but to use the official figures.

The study team also found evidence of improved data storage practices among the districts with recent coverage improvement. Frequently, health centers do not keep copies of completed reporting forms or spend much time on data management. There were notable exceptions: 1) in Bali, where researchers found that data were well archived in four out of six health centers; 2) in Ndop, where urban health areas demonstrated the most meticulous archiving of all districts visited and the manager could produce all data requested for 2007 through 2010; and 3) in Kribi, where the district chief recruited staff with specific skills in data management. Respondents identified these data management practices as important tools for focusing program efforts to meet the needs of specific health areas or populations.

6.2 DOMAIN: SERVICE DELIVERY

The service delivery domain includes drivers such as:

- Service delivery strategies
- Quality of services
- Infrastructure

Common mechanisms among districts with improved coverage are listed Table 14 and discussed in detail below.

Table 14. Service delivery domain: Drivers common in districts with improved performance and their mechanisms

DRIVER	MECHANISMS	DESCRIPTION
Service delivery strategy	Tailored fixed-site strategies	Flexibility, socialization, cultural integration, and creativity used in facilities
	Tailored outreach strategies	Applying knowledge of local communities to outreach services
	Follow-up and support strategies	Tracking defaulters and registering mothers and children
Quality of services	Reception in health facilities	Efforts to attract clients to facilities
	Concurrent services	Health services provided along with immunization
Infrastructure	Facilities	Maintenance and attractiveness of services
	Cold chain equipment	Maintenance and effective management of cold chain
	Vaccine supply	Supply system for vaccine management
	Transportation	Financing and maintenance of vehicles and fuel management

6.2.1 DRIVER: SERVICE DELIVERY STRATEGY

In Kribi, Ndop, and Bali, health teams designed specific strategies for fixed sites, outreach, and follow-up that were tailored to the needs and conditions of the communities.

Tailored fixed-site strategy

In the norms and standards of the EPI, fixed sites for vaccination include health centers (public or private) where services are provided on a pre-determined (specific day or daily) schedule for the target group (children ages 0 to 11 months and pregnant women) living within five kilometers of the health center. At the central level, this strategy is recommended for almost all health facilities and the Minister of Health has emphasized its importance. In health facilities where it is not possible to provide vaccines on a daily basis, providers choose a day when the maximum number of beneficiaries is likely to be available for vaccination. As noted by a respondent from an integrated health center in Bali:

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

In Ndop, providers report that they provide immunization for anyone who comes to the facility, calling it the “open vial policy.” Mothers in Ndop appreciated the flexibility of the health centers. They responded as follows to the question: “What do you do when you forget to come on the day they provide immunization?”

“I just take the child and bring him here [to the facility].”

“I can just wait for the following week, in the middle of the week, like Thursday.”

“As for me, I forget too much, I just come and see the doctor; he knows me already.”

The implementation of the open vial policy was not common in Bafang, the district with steady coverage levels. One mother reported:

Sometimes a mother can go to have her child vaccinated and they realize that she is the only one to come. They will not open a bottle for her alone. She will be told to come back another day.

In addition to the regular availability of fixed-site vaccination services, the methods that districts and health facilities adopted to attract mothers to the facilities provided additional incentives for vaccine use. In Bali, researchers found that health staff’s use of culturally-based approaches—songs, personal communication between service providers and mothers, and a friendly atmosphere at the facility-- were key. These strategies not only encouraged immunization but also established client loyalty and respect for the immunization schedule. In Ndop, a mother explained the local perceptions of RI service days:

When we arrive [for the immunization day] in the morning, we sit down. We greet each other, we smile, and we exchange children. I take my neighbor’s baby and I greet him and she

does the same with my child. She takes my baby and greet her. After that, we take back our children, the first person to arrive says the prayer, and the second one starts singing for the group, a song that everyone sings while clapping hands. It wakes us up and we are pleased to be there. Even if you arrived angry, you become happy.... And then they weigh our children.

Reciprocity among mothers and a sense of community generate a collective demand for immunization services. The mothers of children born around the same time organize themselves to take steps to ensure that their children remain healthy. Domestic work is scheduled to allow women to go together to get children immunized. Health workers wait for latecomers; and mothers go to fetch those who do not show up for the services. Through song, women are reminded about immunization day at the facility. In this way, immunization penetrates the interpersonal networks of women who share the experience of motherhood, from pregnancy to the steps taken to secure child health services.

Interviews in Bali and in Ndop consistently highlighted the lesson expressed by one mother:

The songs are there to familiarize the women with reasons to come to the hospital. Before, they used to come only when their child fell seriously ill.

The words of a popular song in Bali and Ndop explain the importance of immunization: “Pikin well or pikin no well, we must come to the clinic every month! To vaccinate and to weigh baby, we must come clinic every month.” Translated from Pidgin, this means: “Whether the child is ill or not, we must come to the clinic every month, to have the baby vaccinated and weighed.”

Researchers also observed at fixed immunization sites in Bali and Ndop that women sang songs addressed to health workers, to encourage them to work faster and reduce a mother’s waiting time. “Abeg sister, chuck ma pikin a want go cook I chop.” Translated from pidgin, this means: “I beg you Sister, inject/vaccinate my baby; I want to go and cook my meal.”

Tailored outreach strategies

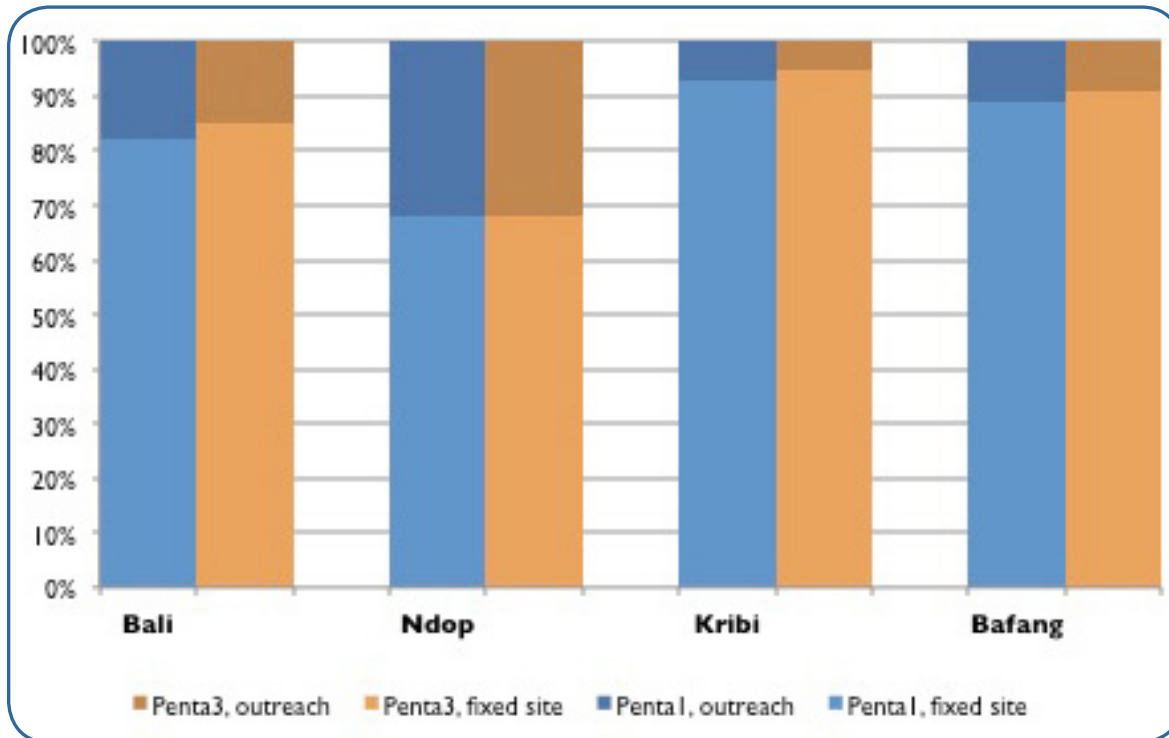
The norms and standards of the EPI define outreach immunization strategies as follows: “immunization sessions held outside the health center for the part of the population that lives far from the health center (beyond a five-kilometer radius or beyond an hour’s walk) or whose geographical access to the health center is challenging. Staff visit villages based on a pre-arranged schedule.”

A comparison of the percentage of children who receive Penta1 and Penta3 by fixed site or outreach reveals that all study districts delivered more doses in 2009 and 2010 at fixed sites than through outreach (Figure 12). However, there are important differences in the districts’ experiences.

Ndop delivered the highest proportion of doses through outreach, followed, in descending order, by Bali, Bafang, and Kribi. Ndop uses outreach more frequently, because the population is mostly rural and spread across the district. In contrast, Bali, while also rural, is small and most mothers can easily reach health centers to receive immunization. In Kribi, the relatively limited use of outreach as opposed to fixed-site strategies relates to that district’s urban

character and to the location of vaccination sites in health centers near plantations for the convenience of workers and people living in surrounding villages.

Figure 12. Percentage of Pental and Penta3 vaccines used in fixed-site and outreach strategies, 2010



In the districts where outreach was successful, strategies were based on sound understanding of the environment and the local dynamics—particularly routine movements of the population. Community members often helped organize these services, as illustrated by a respondent from Kribi:

We had to fix a day in each village on which immunization was going to be delivered. After a brief survey, we chose Tuesday in some villages and Thursday in other ones. Both days correspond with the days that the women are in their villages with their children preparing the cassava.

In Ndop and Kribi, the health teams also assigned health workers to specific areas or zones for outreach. The workers made repeated visits to these areas, and over time, built strong ties to the communities. A respondent in Kribi reported:

The health area has been divided into two zones (one area for Tuesday and one for Thursday). Some vaccinators were in the “Tuesday zone” and others in the “Thursday zone.”...This approach allowed us to reach our objective: to immunize the largest number of children possible.

Effective outreach strategies were also bolstered by health worker behavior in health areas in Ndop, Bali, and Kribi. For example, when the research team accompanied a nurse on an outreach visit in Londji (in Kribi health district), they observed that he worked closely with the social mobilization organizer in the area and the local women to inform mothers about immunization. He asked an old woman to go and call the women from their domestic chores to attend the immunization session. The nurse had built a web of relationships that he used to reach the target population and make the outreach session a success.

In contrast, interviews held in Bafang, the district with steady coverage, revealed instances where communication between health workers and the community was poor. A health worker reported that “often, we go for outreach, and we find no woman or child to vaccinate.” In a follow-up interview in the same community, the researchers were told: “We never know when the nurse is coming so that we can prepare.”

Follow-up strategies

All districts employed a strategy enlisting community support to trace immunization defaulters. However, only Ndop and Bali reported systematic use of defaulter tracing. The chief consultant of Northwest Region reported:

All pregnant women are registered. I did an impromptu supervision visit to see if this was working. All women were registered for antenatal care and the children were also registered. Mothers' awareness of immunization improved and many are now committed to having their children vaccinated. This is what made coverage increase in Bali.

6.2.2 DRIVER: QUALITY OF SERVICES

Two aspects of service quality were linked to improved immunization coverage in Kribi, Ndop, and Bali, and were absent or weaker in Bafang: the way in which mothers are welcomed at the health facilities and the type of services available at a facility alongside with immunization.

Reception at health facilities

The way in which mothers or caretakers are received at a health facility is an important service delivery strategy. The delegate of the Northwest Region reported:

From the outset, we noted that the reception that mothers receive in the health facilities could be an important factor. Women prefer to go to a distant facility if their local facility lacks effective ways of welcoming mothers. Some prefer the faith-based health facilities and even avoid going to health centers that are closer to them.

In Ndop and Bali, the welcome that mothers receive made the health centers attractive, particularly in the health areas of Bamessing and Bawock, which compete with local faith-based health centers. In these areas, the government centers explicitly emphasize hospitality and interpersonal communication. Center managers stress the need to respect clients and not to use crude language or show anger with them. Latecomers are not sent away without receiving services. A respondent in Ndop reported: “The welcome we provide has become a focus of

our training. We educate our staff during staff meetings; we see that they do not speak rudely to women. Sometimes I go to monitor and correct them.”

To illustrate, below is a description of the interaction between health workers and health staff in Bamunka, in Ndop health district:

Question: *How do you ensure that women come here and don't just go anywhere else?*

Response: *I think it is the way we welcome them here. I say, “Mami, what brings you here?” She may say: “I have come with the baby and he/she is not well.” I will then reassure her that the problem will be taken care of. Then I welcome her and take the child's history and health problem. I think it is very important, the way people are received here. We treat women and all other people who come here as our friends. And also, now with the TV and good CDs, the women can watch programs when they come here. I think this enhances the use of the hospital. The people, I mean the women and patients, appreciate it very much.*

In Bali, during focus group discussions, mothers reported that the health worker gave them the impression that he was waiting just for them. The fact that there is physical contact between service providers and children is also considered a sign of affinity and respect that improves the quality of the interaction. Mothers did not report similar satisfaction with service quality in Bafang.

Concurrent services

Officially, immunization is part of a basic package of curative and preventive services that health workers provide in a community. In Ndop, health staff note that “weighing is a lure for immunization.” This idea was echoed several times by respondents in Bali. The opportunity to weigh a child attracts mothers to health centers, and while there they can also receive immunization. In addition, the quality of the services from health providers is appealing to mothers and ultimately influences their decision to secure immunization for their children. In contrast, in Bafang health district, mothers reported limited access to complementary services. One said:

We just have our babies vaccinated, and we go back home. We would like to be given advice; we would like our babies to be weighed... ”

In the songs sung during the focus group sessions in Bali and Ndop, researchers learned that women expect to find a variety of services at a health center, as noted

“So we go do weti? Alleluia!” (“So, what are we going to do? Alleluia!”)/

“For attend clinic nather best! (To attend clinic is good as well!)/

“For take vaccine nathe best” (“To get vaccinated is good as well!”)/

“For chop balance diet nathe best” (“To eat a balanced diet is good as well!”)/

“For use mosquito net na the best” (“To use a mosquito net is good as well!)/

“For keep hygiene nathe best” (“To have good hygiene is good as well!”)

“For chuck pikin nathe best” (“To vaccinate the baby is a thing as well!”)

6.2.3 DRIVER: INFRASTRUCTURE

All four mechanisms identified in the infrastructure driver category were consistent across the three improving districts, including the availability of basic facilities, cold chain equipment, vaccine supply, and transportation. Table 15 reports the total number of facilities by type that offered immunization in three of the four study districts.

Facilities

The presence of adequate numbers of health facilities in a district is an important parameter for the achievement of immunization activities. In the study districts few new health facilities were built between 2006 and 2010. Thus, increased coverage during this period appears unrelated to an increase in the number of facilities. The exception is Kribi, where many small health stations were introduced to provide vaccination services. Those types of stations do not exist in the other two districts where coverage improved but were reported in Kribi to have improved access to care in the district. As several mothers noted:

... It must be said that a lot of effort has been made. Today, when we go have our children vaccinated, everything goes very fast.

All women are unanimous in that things have changed. Before, having a child vaccinated took a lot of time—two to three hours. Now it’s a matter of minutes.

I think the fact that they have increased the number of places for immunization in Kribi has improved the situation. Before, everyone went to the Center of Infant and Maternal Protection, but now more and more women go to other immunization centers.

Table 15. Facilities Offering Immunization in Bafang, Ndop, and Kribi health districts, 2010

INFRASTRUCTURE INDICATOR	BAFANG	NDOP	KRIBI
Number of hospitals	2	1	3
Integrated health centers	23	24	24
Health stations	0	0	18
Private health centers (that offer vaccination)	8	3	8
Faith-based health centers (that offer vaccination)	5	7	2

Cold chain equipment

At the central level, authorities monitor the availability and performance of refrigeration equipment regularly through periodic assessments. Investments are made and equipment purchased or renewed based on this information. In the opinion of several sources at the central level, Cameroon has achieved and maintained refrigeration equipment at levels that are adequate to support the country's current immunization program. Nevertheless, regions such as the Northwest reported significant deficits in refrigeration equipment from 2005 to 2006 and rigorous efforts to update the cold chain began in 2007, using funds from local, national, and development partner sources.

In the study districts, interviews and observation suggested no major problems with cold chain equipment. Power cuts that occurred at the time of the study did not disrupt service delivery or vaccine quality, because alternative refrigeration equipment was available.

Vaccine supply

The distribution of vaccines is coordinated through a system managed at the central level of the EPI, with support from other structures at intermediary and operational levels. Vaccines are supplied by two sources.

- UNICEF is responsible for acquiring vaccines using funds provided by international partners. It supplies products from that are pre-qualified using formal procedures applied at its logistical center in Copenhagen.
- Cameroon National Central Drug Supply (CENAME) is in charge of providing the EPI with vaccines that meet WHO's standards of quality.

According to official sources, the EPI receives six shipments of new vaccines and two shipments of traditional vaccines a year. Each new shipment comes bundled with syringes and safe-disposal boxes. A committee of six people—two from the Directorate of Pharmacy and Medicines, two from the National Laboratory for the Control of Drugs, and two from the EPI—conducts quality checks of each set of vaccines received and decides whether sets may or may not be dispatched throughout the country.

Evaluators periodically assess the EPI's performance in vaccine management, focusing on but not limited to the existence of an annual plan governing the supply and distribution of vaccines, vitamin A, and consumables; the maintenance of up-to-date stock records and forms for vaccines, vitamin A, and consumables; the monthly wastage rate for each antigen; stock shortages; and vaccine stock outs.

During this study, researchers found no evidence of a stock out or supply shortage that would have affected program operations from 2007 through 2010 in any of the study districts. The only exception noted was for the Bacillus Calmette-Guérin (BCG) vaccine, which ran out at the central level in 2009.

Transportation

Transportation to support supervision and to deliver vaccines to the regions and the districts is managed at the central level. The health areas are supervised by health district staff members using government vehicles (where available) or using the personal vehicle of the health district chief consultant. All study districts face transportation challenges in conducting outreach from health centers. Bafang had the most motorbikes (11), including six based in the capital of the district and five at the subdistrict level. Ndop and Bali each had seven motorbikes, and Kribi had the fewest, with five. The number of motorbikes available for outreach does not seem to explain the differences in performance. However, in one district where coverage improved (Ndop), the challenge of reaching vaccination sites for supervision or outreach was mitigated by support from development partners.

INFRASTRUCTURE INDICATOR	BAFANG	BALI	NDOP	KRIBI
Number of motorbikes in service for the EPI	11	7	7	5

Table 16 compares several indicators of service quality, including vaccine management, waste disposal, cleanliness, and public posting of the immunization schedule based on data collected through observation and record review during visits to health centers in Ndop and Bafang. Few differences related to vaccine management emerged between the districts with increased coverage and the district with no improvement in coverage. Nor were there differences in cold chain reliability, suggesting that factors other than the availability of viable vaccines drove immunization coverage improvement in Kribi, Ndop, and Bali.

Table 16. Observations on vaccine management: Bafang and Ndop health districts

INDICATOR	BAFANG STEADY COVERAGE	NDOP IMPROVING COVERAGE
Transportation challenges reported	Yes	Yes
Cold chain interruptions in the past year	No	No
Storage of vaccines at the right temperature observed in all health areas	Yes	Yes
Refrigerators in working condition in all the areas covered by integrated health centers	Yes	Yes
Vaccines available in all the areas covered by integrated health centers	Yes	Yes
Appropriate waste disposal in all the areas covered by integrated health centers	No (3 of 4 adequate)	No (3 of 4 adequate)
Waiting room (for immunization) clean and well maintained in all the areas covered by integrated health centers	No (1 of 4 health areas were adequate)	Yes
Immunization schedule posted in all the subdivisional and integrated health centers	Yes	Yes

6.3 DOMAIN: COMMUNITY INVOLVEMENT

Within the community involvement domain there are three main performance drivers:

- communication
- stakeholder involvement
- community ownership of immunization

Table 17 summarizes the mechanisms of each driver in this domain.

Table 17. Community involvement domain: Drivers common in districts with improved performance and their mechanisms

DRIVER	MECHANISMS	DESCRIPTION
Communication	Implementation of communication strategies	Association of formal and informal types of communication
	Routine communication	Interpersonal communication
	Additional communication channels	Raising awareness
Stakeholder involvement	Linked health and community structures	Channels for official involvement
	Involvement of local authorities	Administrative, religious, and traditional leaders involved in immunization
	Involving community-based organizations	Association of formal and informal networks
Community ownership of immunization	Social acceptance of immunization	Sociocultural perceptions of routine immunization
	Integration of immunization into local social fabric	Social control of immunization

6.3.1 DRIVER: COMMUNICATION

Drivers in the communication category were expressed in three ways: through the structures and strategies established for communication; routine communication activities; and additional activities for special efforts such as health weeks. These three driver mechanisms are linked with one another at the central, regional, and service delivery levels.

Implementation of communication strategies

At the central level, a national communication plan has been established whose primary objectives are advocacy, mobilization, and behavior change. The plan covers the placement of communication focal points at regional, district, and health center levels and local mobilizers with appropriate language skills. The job of these workers is to foster behavior change and to reduce resistance to immunization. The communication plan has a management component that highlights the location of religious communities opposed to immunization and promotes the development of networks to counterbalance any opposition to immunization. In addition,

in the districts of Bali and Ndop, there are community networks, women's associations, and traditional channels run by the Fon where local communication supports uptake of immunization services by the general population. Examples of specific communication activities include: the intensification of message dissemination in churches and mosques and, in Ndop, a network developed by NAFI (an NGO) that includes more than 80 community-based associations.

Routine communication

Routine communication about RI focuses on information about injection safety and free RI and related services. Communication aids are posted in health centers and messages are sometimes included in audiovisual media or the written press. However, most written messages are in the official languages (French and English), which many women cannot read. Personal communication between health workers and clients during client visits to health facilities does the most to advance RI. The effectiveness of these conversations depends on the skills and cultural knowledge of the health worker, as discussed above.

Additional communication channels

Cameroon has extensive experience using mass communication for immunization campaigns—a strategy employed since independence, when National Immunization Days began to be observed. Currently, SASNIM is supported by a mass media communication strategy and local efforts to mobilize families by organizers who go door to door and use socially relevant communication methods. The messages broadcast during this health week present general information about RI and encourage immunization. As such, the SASNIM was considered by several informants to have made an impact on attitudes and behaviors related to RI.

6.3.2 DRIVER: STAKEHOLDER INVOLVEMENT

Across the three levels, stakeholder involvement in immunization activities also contributed to performance improvement. In the districts where coverage improved, researchers found that the official health and community structures provided the foundation for community involvement. However, informal efforts to involve local authorities and work with community groups and NGOs played an equal if not more important role.

Linked health and community structures

The organizational chart below (Figure 13) presents the hierarchy of health and community structures and the relationship between the two groups at each level. In Kribi, Ndop, and Bali, district chief consultants and communities reported that they held regular planning and coordination meetings with the health committees and the management committees, as discussed above.

Involving local authorities

At the central level, the involvement of local authorities is encouraged, and the health sector leaders collaborate with opinion leaders to raise awareness of health and immunization issues. At the regional level, governors and district authorities are reported to support press releases and mass media message related to health. However, traditional authorities seem to have the biggest impact on immunization seeking behavior. When representatives of churches and mosques remind followers to immunize their behavior and relay other immunization messages, they give immunization credibility.

Health clients in Kribi reported:

It is the church that encourages us; the priest often announces the dates of appointments [for immunization].

In Ndop, a community member said:

... 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 followers. We have a health committee.

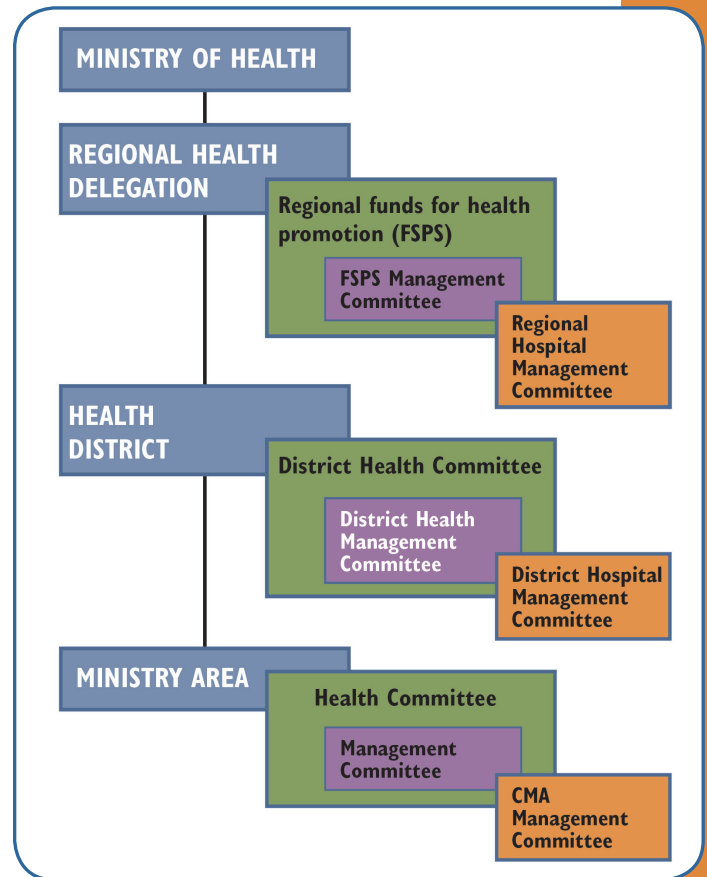
In Bali, the traditional chieftaincy is involved, through its highest ranking member—the Fon – who mobilizes the local communication structures and uses his authority to promote acceptance of immunization.

On the market days, the Fon sends some of his traditional members to spread information on immunization, or to raise awareness in the community about a particular vaccine.

The health districts of Bali and Ndop bring together all the local authorities—spiritual, traditional and modern—to encourage community members to participate in health center activities. As a health worker reported:

We write letters to inform the traditional council, the Fon, the administration, and the church. The church is often the first to be informed, because they have a large congregation. Even the heads of quarters are informed, so that we know which public holiday (country Sunday) is the best date [for scheduling immunization activities]."

Figure 13. Operational relations among levels of the health system



Box 3. Women's Groups Supporting Immunization

In Bali, a respondent discussed her women's group, or "njangi," with an interviewer. The group, called Unique Women, comprises 35 women around the world, with active members in Cameroon and the United States. The respondent discussed the organization of her njangi and how the members mobilize around immunization:

-In your njangi, does the doctor ask you to give information about health programs?

"Yes, he gives us small messages that we read during meetings."

-Why you?

"We are the first women's njangi in Bali. We are one of the most organized groups. He calls us and some other groups too."

-How do you communicate with him?

"We have his phone number and he has ours; when there's a problem we call or he calls. That's why you are able to speak to us now.... He called me knowing that I am a member of the njangi. Once I know, everybody is aware. Immediately after he met me, I met with our group."

-It's amazing. I still ask: why you?

"We are the principal actors of social mobilization and we can mobilize hundreds of people."

-How do you meet with the other members?

"By phone, we use a phone to call. When the message reaches the president, she calls everybody. We keep a phone for that purpose only."

-Who puts credit in it? Is it the doctor?

"We do! The doctor doesn't. We put money aside for that. It is for health. It's no joke."

-Do you think your calls have any impact on people?

"Yes, they have. People listen and follow up."

-Are you the only group to be so involved?

"No, when the doctor writes to us, he writes at the same time to other groups. For example during the AIDS week, he usually writes to us and to other very active groups."

Involving community-based organizations

Bali and Ndop health district are distinguished by their capacity to engage community-based organizations in health activities. See Box 3 for an example from Bali. In NDOP, the organizations are mobilized through NAFI, a powerful local NGO that works in the field of health. PLAN Cameroon worked with NAFI to engage 84 community-based organizations, primarily women's groups, including Christian Women's Fellowship (CWF) and Catholic Women's Association (CWA). A respondent in Ndop said:

We also visit local ethnic groups of Bamumka, so that they can explain to the communities what we are saying or what we are up to. They speak in their language. During the holidays, we also gather young people together. This year, we will have one month devoted to young people, to teach them about their health and their family's health.

6.3.3 DRIVER: COMMUNITY OWNERSHIP OF IMMUNIZATION

In the districts where coverage improved researchers found that the communities had integrated immunization into society and culture in ways not found in Bafang. These aspects of the performance driver are illustrated below.

Social acceptance of immunization

In Bali and Ndop, and to a certain extent in Kribi, it appears that people perceive immunization as an important social act, where women recognize when to go for vaccinations in response to local reminders from authorities and other women. Immunization has become integrated into the social fabric of the culture through local support for the services. Box 4 illustrates the extent to which immunization has become integrated into society in these health districts.

Integration of immunization in the culture

Virtually all the health areas of Bali and Ndop offer relevant examples of local acceptance and comprehension of immunization through the medium of popular songs. In these communities, songs provide an important example of how communities integrate immunization into the culture and how this integration increases acceptance and use of the service.

Popular songs that convey messages about immunization or maternal and child health were collected during fieldwork in these districts. Songs were recorded in training sessions for community mobilizers and in focus group discussions that were held in all the health areas of Bali and Ndop. Researchers observed that when the women sang together, they affirmed their social bonds of motherhood, culture, and language. Singing is their communication tool par excellence for raising awareness and modeling individual and collective behavior. The women also used singing to convey messages to health workers, such as the need to provide vaccination in a timely manner at a health facility.

Singing is found throughout Northwest Region. Among the people living in Bali and Ndop, songs are used to build and maintain social cohesion and are linked to key events. Women told researchers how they sing during the births of children, while they are working in the fields, when the family meets, during marriage ceremonies, during funerals, or simply to calm down a crying child after a vaccination or when the child is hungry.

The lyrics of the songs about immunization reveal devotion to regular use of health services; enthusiasm for weighing children (because a child's weight lets a mother know if her efforts to keep her child healthy are working); and the mutual support and trust women share in child rearing. On a practical level, through singing, women easily retain health messages and the dates of their children's next clinic appointments (See Box 4).

Singing demonstrated a strong cultural acceptance of immunization in Ndop and Bali. However, in Bafang, the district without coverage improvement, women did not sing immunization songs, which could indicate less cohesive social acceptance of immunization.

Box 4. Illustration of Cultural Support for Immunization

Q: How do you know when you should go and get your baby vaccinated? Who reminds you of the date?

Mother: "Between women we remind each other. You can forget but you see another one [mother] going, and you remember." (Kribi)

Mother: "My husband sometimes, or my neighbor who has a child, or another friend who also has a child. We often do it like that." (Ndop)

Mother: "Sometimes, it is announced in the church and everyone hears." (Ndop)

Mother: "It is also written in the vaccination record." (Ndop)

Paying attention to local ceremony calendars allows the health staff to make immunization part of that agenda.

Respondent: "That is why most of our activities are led during "Country Sunday"; it is a day when no farming activities are allowed in the village." (Ndop)

Respondent: "The 'Sundays of the villagers' provide opportunities for consciousness-raising about immunization and registration of children of 0 to 5 years and pregnant women and children who have not received or completed their vaccines. On 'country Sundays,' the place is full of women who come to have their children vaccinated." (Note: A Country Sunday rotates within a week; it can be a Sunday or any other day of the week that people use to offer sacrifices to the ancestors to solve all the problems of the community, health problems, conflicts, political problems, and so on.)

Mother: "It is not even possible to skip a vaccination, because mobilization organizers will come and warn you... If you do not vaccinate your baby, people will laugh at you. It is talked about and announced in church, in meeting houses, in the market... everywhere." (Bali)

Respondent: "Here, immunization appears to be an instrument that values the community's relationship to a child. A child is an individual being. He/she chooses to stay in the host community or continues his journey to the hereafter according to the care and attention he is granted by the community. A child is a host through whom we can assess the ability of the community to show hospitality." (Bali)

6.4 CATALYST: HUMAN FACTORS

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. These strategies were critical for mobilizing new resources, reaching underserved or resistant communities and getting the most out of a workforce. The study team found that in the districts where coverage improved, drivers were not applied mechanistically but were underpinned by these human factors, which catalyzed the drivers' capacity to improve immunization coverage. Three human factors that emerged in this study are:

- health workforce capacity
- social inclusion
- motivation

Table 18 summarizes the mechanisms used to introduce the human factors defined within this domain.

Table 18. Human factors domain: Strategies that enhanced the effectiveness of performance drivers in districts where coverage improved

HUMAN FACTOR	STRATEGY	DESCRIPTION
Health workforce capacity	Technical skills	Knowledge to design and implement immunization services
	Health worker behavior	Patience and availability
	Social capital	Integration into the community
Social inclusion	Gender approach	Women's social control of immunization spaces and processes
Motivation	Participatory approach	Systematic community inclusion in the processes of design, implementation, and evaluation of the management and delivery of immunization services
	Recognition	Interfaces among management, health workers, and communities

6.4.1 HEALTH WORKFORCE CAPACITY

In each district where coverage improved, respondents reported that health workers (government and community) were able to provide high quality, client-centered services. Technical skills, effective provider-client behavior, and efforts to gain acceptance in the community contributed directly to an immunization program's performance. District managers seemed to recognize the importance of these characteristics in health workers and therefore invested in training and provided opportunities to build the capacity of their staff and community workers.

Technical skills of health and community workers

Examples of the links between the technical skills of health and community workers and RI performance were found in all three districts where immunization coverage improved.

- In Kribi health district, the chief consultant reported that one of his first actions when taking up his post in the district was recruiting a team member with training and experience in statistics and computer science. The addition of those skills improved the quality and reliability of the immunization data that the district team reported, allowed the team to measure their performance using data and gave administrators information they needed to manage programs and secure resources effectively.
- In Gungong area (Bali), the head nurse of the health center compensated for lack of public sector workers by training community health workers in service delivery procedures and communication messages used at health centers and other fixed vaccination sites. Thus, even when the nurse was away conducting outreach, vaccination services and immunization messages were provided to clients in the health center.
- In Ndop health district, researchers observed technical training of social mobilization organizers. The training aimed to improve the organizers' competence to promote immunization, thereby enhancing their credibility within the community.

Health worker behavior

The quality of interaction between health workers and clients is fundamental to clients' acceptance of immunization and their willingness to return for subsequent vaccinations. In the districts with improved coverage, respondents noted that health workers often acquired these skills through training and practical experience that allowed them to reduce interpersonal tension and other obstacles to good communication. In Ndop health district, the chief of the Bamesing health center reported that he trained his staff in order to improve service quality and communication. A retired nurse in Kribi said that health workers involved in outreach must be trained to have patience, perseverance, and the ability to listen to clients and community members.

Social capital

The capacity of health care providers to serve as external and internal advocates—promoting immunization to community leaders and procuring resources from their superiors—depends on the trust they have earned from the community and from their colleagues. This trust is social capital, which skillful providers use to mobilize their formal and informal community networks in support of immunization.

6.4.2 SOCIAL INCLUSION

Gender approach (women-focused)

In Ndop and Bali, health managers incorporated gender-based strategies to improve RI performance. In Ndop, the chief consultant in the health district encouraged the placement of

women at the highest decision-making level in community structures. In Bali, the district health chief formed direct links to powerful women's organizations, which are central to community mobilization. Ndop and Bali timetables and immunization promotion strategies reflect knowledge of women's work schedules and communicate respect for those schedules.

Participatory approach

A common characteristic of the Kribi, Ndop, and Bali health districts was the highly participatory approach of district leaders. The chief of the Kribi health district describes his work style as participatory. He includes all local collaborators in consultations on service strategy and decision making. In Ndop, community-based associations participate fully in coordination meetings organized by the health district and local chiefs take part in the decision making bodies. The traditional chiefs of the Fulani and Bororo ethnic groups in Bali and of the Pygmies in Kribi receive official requests to contact populations that are difficult for the health services to reach. These kinds of participatory approaches have reduced opposition to immunization and increased demand. Box 5 includes examples of participatory management strategies used in Bali.

Box 5. Drivers Interacting: Review Meetings in Bali

In Bali, district leaders set the agenda of meetings and other coordination efforts in order to train staff and support the health facility teams. Respondents described the coordination meetings as having an important training dimension, allowing the chiefs of the health centers to acquire new knowledge regularly. Managers for the Northwest Region use review meetings to promote interaction between regional and health area managers, focus the attention of senior managers on local issues, and to give local managers forum to make suggestions and propose solutions to common problems.

In Bali, respondents described the district chief as a person who respects others, supports the self-actualization of colleagues, and maintains confidentiality when required. Health workers believe his style is inspired by traditional methods of conflict management. They say it is "more humane" and more likely to produce a positive result than the authoritarian style and "public humiliation" used during the "classic program meetings." The district chief explained his approach to his colleagues as follows:

When I have something to say to them (health center managers), I call them individually to my office where we sit face to face and have a confidential discussion. They see this as a sign of respect and in return they are grateful.

This account was confirmed by the health center chiefs, who reported that the district chief shows great respect for human dignity, which inspires them to make all the sacrifices required to achieve their targets—not out of fear but respect.

6.4.3 MOTIVATION

Recognition

At the central level, the EPI is increasingly recognized as a critical social program for Cameroon. The government has started to acknowledge efforts made by health workers and community members who support immunization through letters of recognition and invitations to take part in high-level meetings. This kind of recognition appears to transcend the individual recipient and is perceived as an award for the entire team or even the community. In the course of this study, the women from Gungong (Bali) asked researchers to transmit to regional and national authorities their desire to have a letter of service recognition sent to their health center chief. A woman noted: “We can only say we are grateful for the services and the care we receive from our health center, because they take good care of us. Only God will bless them and bless the chief, because at any time of day or night, he is available. Even when the center is closed, if someone comes with a baby, they call him on the phone and he comes and takes care of us.”

7. DISCUSSION AND CONCLUSIONS

Since Cameroon gained its independence in 1972, national immunization coverage has improved steadily. Rare moments of stagnation or slight decline seem to be linked to passing periods of economic crisis or a temporary drop in international financial support. At the central level, respondents credited Cameroon's performance to consistent political will and government commitment to immunization and child health, to financial and technical support from international partners (e.g., GAVI, WHO, UNICEF, and international NGOs), and to the country's consistent application of RI performance strategies such as RED. Subnational service delivery gained strength from improvements in 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 investigation of RI systems focused on four districts to explore in depth the drivers of RI performance improvement. The study identified nine drivers and three catalytic interventions that influenced recent improvements in DTP3/Penta3 coverage. All nine drivers and three catalysts 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 access to immunization and acceptance of the service by the community.

Other studies have also reported multiple factors influencing positive changes in immunization performance (Naimoli, 2008). However, the ARISE study in Cameroon goes further, constructing a unifying framework to guide the conceptualization of performance improvement for RI systems. The framework consists of three important and mutually reinforcing domains that are critical to understanding RI performance improvement pathways: *system foundation* (fundamental health system structures and processes); *service delivery* (strategies, quality, management, and supply chain); and *community involvement* (communication, stakeholder involvement, community ownership of immunization). The framework also describes catalytic "people-focused" strategies that motivate health workers and caretakers to achieve immunization program goals. The influence of the human factors underpins the three domains, enhancing the effectiveness of the drivers by focusing on areas such as participatory decision making, respectful behavior between health workers and clients, and empowerment of people at all levels with technical skills.

The study of drivers of routine immunization performance in four districts in Cameroon has 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 a sufficient number of sites for delivery of immunizations. Without this foundation, many of the other driver mechanisms would not have been so successful in improving coverage.

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 made permanent assignments of health workers to outreach sites to foster cohesive relationships between the health worker and the community and a shared commitment to reach all children with vaccines. In Ndop, health managers and workers emphasized the quality of services, the cleanliness of service sites, and health workers' respect for caretakers. In so doing, Ndop workers built a good reputation for the health services that drew people back for care on a regular basis. The workers also reached out to the community to find defaulters and encourage them to complete their children's immunization schedules. Bali respondents stressed the importance of community cohesion and regular, reliable, and high-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. They made forceful references to local culture and listened to suggestions, inspiring trust that allowed them to 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 a variety of ways**. For example, GAVI's suspension of funds came up in several interviews as a detrimental influence on coordination, supervision, and staff motivation. Yet actors on the national and district level found ways to accommodate this decline in resources, by channeling alternative funding sources and mustering additional efforts to deliver vaccines. The decline and recovery of immunization coverage after the suspension resulted from the immunization system's capacity to compensate for changes in external funding flows (using state and private resources) and also to its capacity to adapt to changing circumstances as needed. This flexibility has spurred the introduction of new strategies for service integration, the reorganization of RI 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 these district teams to work within resource constraints and reach communities with immunization services. Thus, critical to understanding performance change is the notion that improvement depends not only on the drivers described in this report but also on the ways these drivers 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 the commitment of local government and caretakers to immunization. Other managers took the WHO's RED strategy and renamed it "Reaching Every Child," tailoring a global approach to their local context and engendering ownership and commitment. This creative application of resources and ideas to solve problems and achieve goals required local leaders and managers to understand strategic concepts, rethink them, and adapt them effectively. Boxes 6,7 and 8 provide examples of how several RI performance drivers work together to improve immunization coverage.

Box 6. Drivers Across All Domains at Work in Kribi Health District

Kribi district illustrates how the drivers from all domains worked in concert to improve immunization system performance. The district operates under a strategic plan that is based on thorough knowledge of the district and focuses on several key strategies: improvement of data management; making contact with hard-to-reach populations; involvement of private health centers in immunization service delivery; and emphasis on the Maternal and Child Health and Nutrition Week (SASNIM).

Improvement of data quality: The chief of Kribi district decided to invest in data management when he was hired. He said:

When I arrived at the district, I found that there were very few staff members appointed for statistical data management and processing. The people were very stressed when they had to produce reports for the region, and the region was pressuring them all the time. Consequently, we lost a lot of data and the data we had did not seem to be reliable. Reports were incomplete and data were poorly recorded. We often had to repeat data collection and recording. So I decided, with my team, using funds from the district, to recruit a staff member to be trained to support data management.

Improved data quality in Kribi allowed the facility teams to track coverage more accurately and demonstrate their achievements more effectively.

Reaching hard-to-reach populations: The district strategy focused on reaching marginalized groups and extending immunization services to areas previously not covered, especially in Adjap and among the migrant populations of Grand Batanga. The chief district health consultant used community resources to create and support outreach posts, increasing the number of doses provided in Grand Batanga from zero in 2009 to 82 in 2010. The district health chief notes that the involvement of private and faith-based health centers in immunization service delivery "... is to be considered important to the increased immunization coverage rate in the district." He reported:

Including immunization among the services offered by private facilities could be wrongly thought to create more work [for them] with little financial benefit (since vaccination is free). But we managed to show them that immunization helps build loyalty, which has long term financial implications. We do this with technical support. Not only have we shown them how to manage vaccine supplies, but we have also given them advice on the choice of gas or kerosene refrigerators to cope with electricity cuts. We also involve these private sector groups in our data collection system. We give them data collection forms when we provide the vaccines and then we just collect the completed forms; they retain copies for their own statistics.

Capitalizing on SASNIM: The district also benefits from the focus on maternal and child health and nutrition afforded by SASNIM. This health week is important for raising awareness of the principles of immunization and the RI schedule. Coverage increases after this special week, as illustrated in the graph below.

Figure 14. Impact of SASNIM weeks on DTP3 coverage in Kribi, 2010

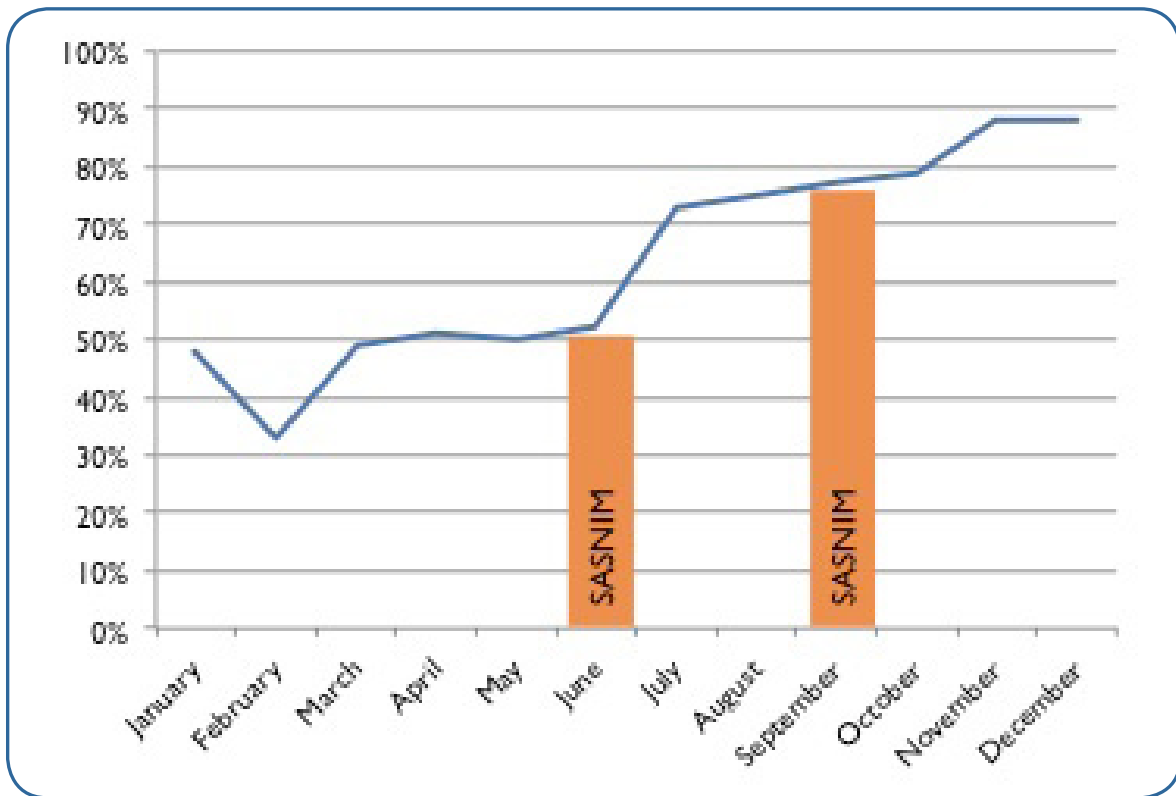
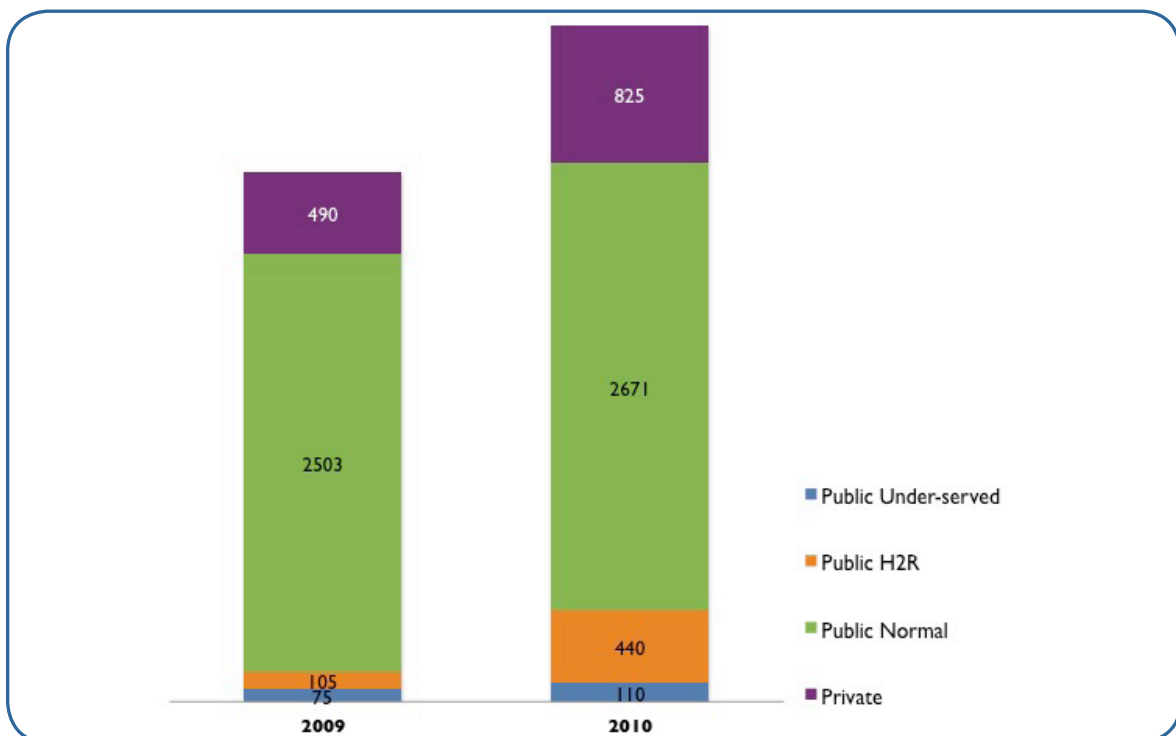


Figure 15. Comparison of DTP3 at public and private sites in Cameroon (2009-2010)



Box 7. Drivers of RI Performance in Bali

In Bali, an important indicator of RI performance is the low dropout rate. In 2010, the dropout rate between the first and third doses of Penta was estimated to be 5 percent. Exploration of performance drivers in this district reveal that several drivers converge to create success in maintaining a low dropout rate. These drivers include friendly, regular, and reliable fixed-site service delivery, follow-up strategies to remind mothers of missed appointments, and overall efforts to adapt services to the local context.

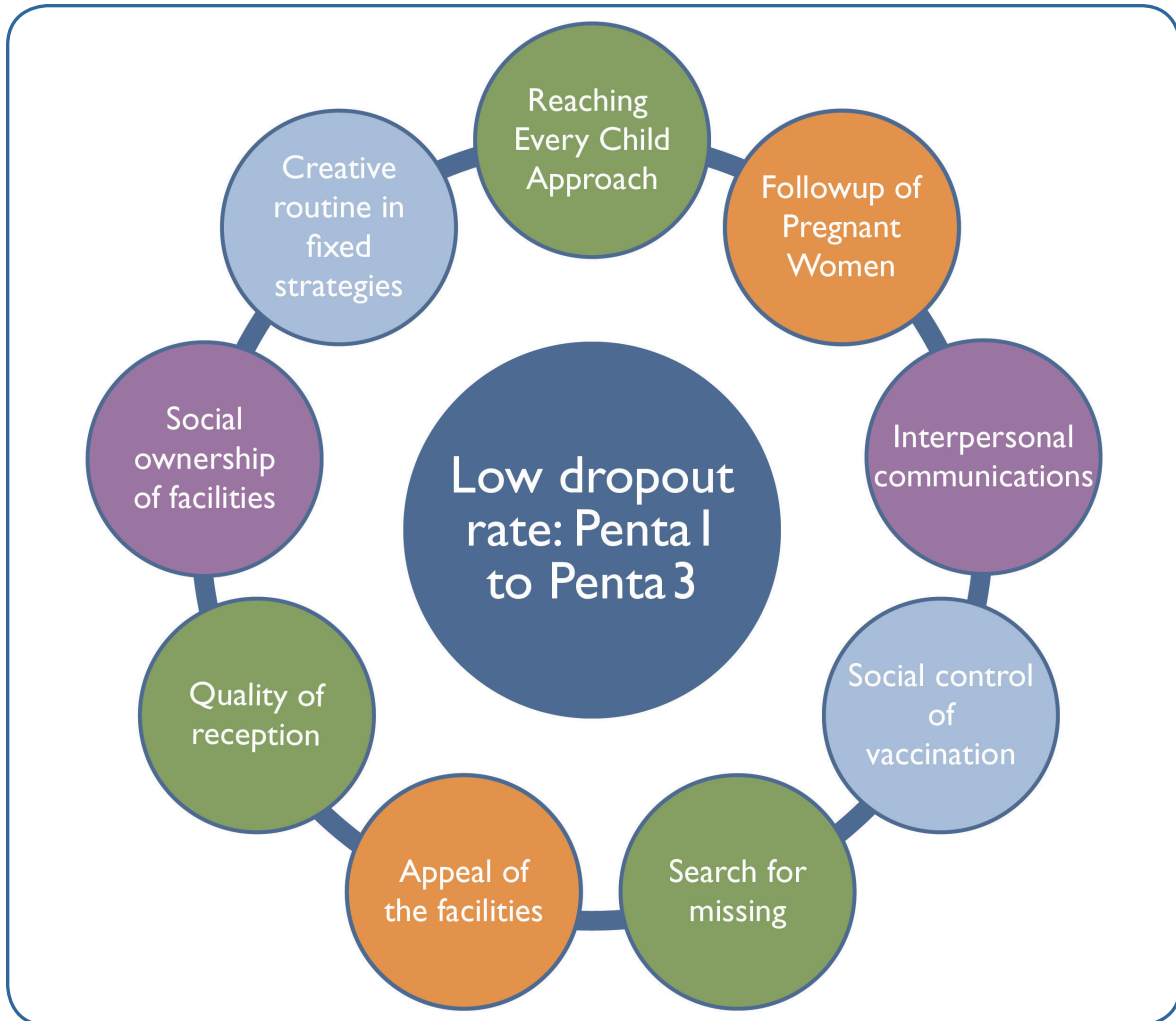
As a health worker in Bali noted:

Women are too occupied with domestic work, by farm work, or by the many activities that generate revenue. Often they forget their appointments [for immunization]. The staff, who know these women, therefore visit homes when they realize that children have missed a follow-up appointment.

In Bali, staff make an enormous effort to follow up with pregnant women and mothers and ensure a welcoming reception at the facility and a high-quality service. This kind of approach seems to work well there, because the district is small. As a result, the catchment population is easily accessible to health workers, who are able to develop a good rapport with the community. Figure 16 illustrates the drivers of low dropout rates in Bali.

In Bali, researchers observed that health centers were clean, that registers and cards were filled out correctly and stored for easy retrieval, and that the schedule for vaccination services and health messages were displayed for mothers to review. Bali's low dropout rate has a strong foundation in the district's fixed-site strategy combined with follow-up of pregnant women; tracking defaulters; strong interpersonal communication between mothers and health workers; and attractive, clean facilities. One health worker in Bali noted that sometimes an outreach strategy is not even needed, because the mothers have accepted the idea of routinely visiting the health facility and they reinforce this behavior through the use of songs. One health worker noted: "I sometimes go to conduct outreach and find only three or four children, and they have already been vaccinated in Bali health district." Mothers also prefer to go to the health center, because the visit is a chance to socialize outside the home. The outreach strategy is therefore more suited to migrant or nomadic populations and health workers use it to reach those groups.

Figure 16. RI performance drivers in Bali



Box 8. How Health Activities Impact Outcomes and Behaviors in Bali

In Bali, the research team also mapped the many pathways that led to improved RI performance, deeming them micro processes. Table 19 below illustrates several micro-processes leading to performance improvement.

Table 19. Micro-processes and their attributed effects

ACTIVITIES/ACTIONS	BAFANG STEADY COVERAGE	NDOP IMPROVING COVERAGE
Immunization on demand outside the designated service schedule	Allows for daily immunization	Adapts services to mothers' social and economic situations
Maintenance of cleanliness and comfort in immunization facilities	Increases service attractiveness and structure competitiveness	Increased community participation
Songs and use of immunization facilities as places to socialize	Embeds immunization in local culture and increases client loyalty	Low dropout rate
Awareness raising and health education in facility waiting rooms	Social stigmatization of mothers whose children missed appointments	Social control of immunization
Personal communication with mothers	Increases service attractiveness and service acceptability	More respect for the immunization schedule
Staff trained to treat clients with respect	Increases facility attractiveness and client loyalty	Increased service use
Registration of and follow-up with pregnant women	Increases respect for the immunization schedule	Increased immunizations and lowered the dropout rate
Staff know the children ("it is not just numbers and writings")	Strengthens individual and community acceptance of health workers	Low dropout rate

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ANNEX I: DEFINITIONS OF KEY TERMS EMPLOYED BY THIS STUDY

Routine immunization system: A set of independent but interrelated components that work in concert to deliver vaccinations on the national immunization schedule effectively over time to each new cohort of children.

Routine immunization system performance: The most frequently used indicator of overall national routine immunization system performance is coverage with a third dose of pentavalent vaccine. However, this biomedical definition does not appear to integrate the multiple dimensions that explain the processes, the underlying factors, and the intermediate steps that determine an immunization system's performance. As noted in the ARISE protocol: *“Understanding why the system succeeds requires a range of metrics that demonstrate the presence and effectiveness of the various system elements that work together to influence coverage outcomes [..]”*

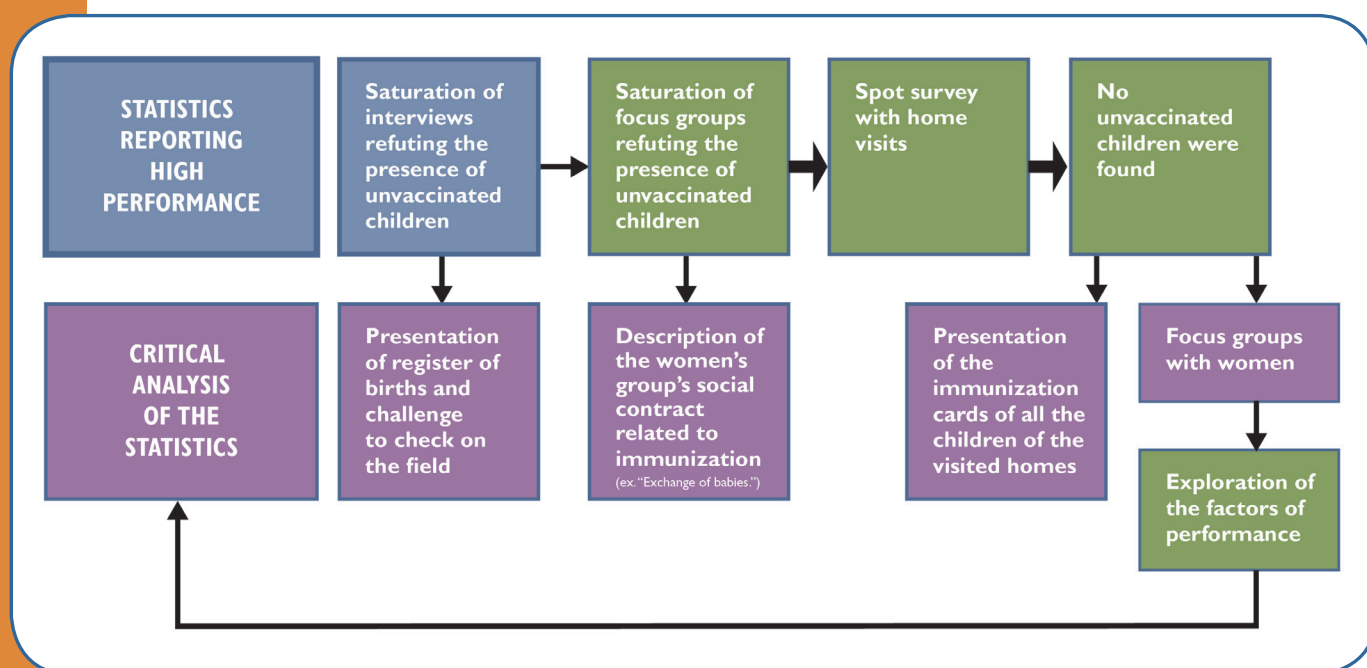
Driver of RI performance: A structure, resource, or process that works on or through immunization system components, and enables the immunization system to perform effectively and improve or sustain coverage. Drivers may have multiple forms, such as:

- specific interventions
- innovations or best practices found in routine implementations
- elements or changes introduced in the overall health system

ANNEX 2: DISTRICT SELECTION AND RECLASSIFICATION OF BALI AND MBANGA HEALTH DISTRICTS

Bali health district was originally identified as a district where DTP3 coverage had not changed during the study period: 2007 through 2010. According to official reports, DTP3 coverage over that period hovered around 33 percent. As often happens in field-based research, the research team found that program experience and district level coverage data in Bali did not correspond with the characterization of Bali as a low-performing district with steady coverage. The process that the research team undertook to explore differing reports of DTP3 coverage and to reclassify Bali as a district where coverage had indeed improved and possibly had reached as high as 75 percent is explained in Figure 17.

Figure 17. Steps to explore reported vaccine coverage in Bali

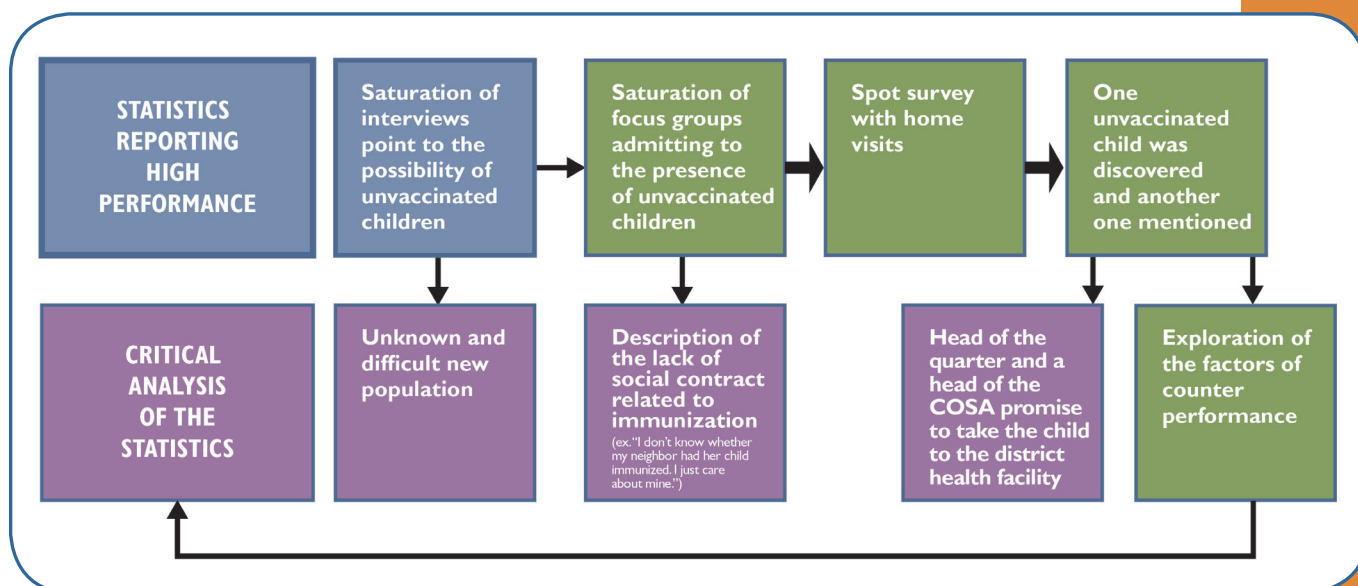


In Mbanga health district, the population is highly mobile, with agro-industry dominating the economy. As in many areas with frequent population fluctuations, interpretation of vaccine coverage data is challenging. Denominators often change, making it hard to assure their accuracy. Thus coverage, dropout, and left-out calculations become less meaningful. In one health area of Mbanga, coverage rates were reported to be as high as 400 percent. Although official figures reported that coverage rose from 80 percent to 93 percent from 2007 through 2010, the research team found several reasons to doubt these estimates.

First, the dropout rate was reported as -5 percent, suggesting that more children received DTP3 than had received DTPI. Second, key informants also reported that health facilities were “not attractive” to the community, that staff and volunteers were frustrated with their working

conditions, that there was a low demand for routine services, and that follow-up to solve persistent problems with service delivery and sustained demand was poor. Health workers also reported that mothers were often confused between vaccines delivered at home through campaigns and routine vaccination services based in facilities or outreach sessions. Third, an informal house-to-house visit to review immunization cards revealed several examples of unvaccinated or under-vaccinated children. The research team concluded that it was likely that population figures were underestimated and that coverage was lower than initially reported. Mbanga's challenge in attempting to serve a highly mobile population is common to other peri-urban areas of Africa. The steps taken to understand the coverage estimates in Mbanga are described in Figure 18.

Figure 18. Steps to explore reported vaccine coverage in Mbanga



ANNEX 3: RESPONDENTS IN THE ARISE STUDY

Interview respondents represent the range of stakeholders of RI services. Table 20 summarizes these categories by level of the health system.

Table 20. Respondent categories

CENTRAL	REGIONAL/DISTRICT	COMMUNITY
<ul style="list-style-type: none"> • Numerous senior government officials* • Official in charge of EPI mobilization section • Representative of the Sabin Institute Sustainable Immunization Financing Project • Representative of the WHO/AFRO Task Force for Immunization • UNICEF representative • WHO EPI advisor 	<ul style="list-style-type: none"> • Regional public health delegate • Head consultant of the regional EPI unit • Chief consultant of district health services • Head clerk of the district health office • Health workers • District health committees • Management committees 	<ul style="list-style-type: none"> • Community members** • Leaders and members of women's groups at health centers • Health committees • Social workers performing community outreach • Community-based organization leaders • Retired health workers • Religious leaders of the Catholic, Protestant, and Muslim faiths • Administrative authorities (prefects of police and their deputies)

*Senior officials included the permanent secretary of the Technical Committee of Sector Strategy (Ministry of Public Health), official in charge of the EPI Mobilization Section, the director of the Family Health Division, the director of Cameroon's EPI, the subdirector of the Immunization program, the permanent secretary of the EPI's Central Technical Group, the head of the EPI Office of Administrative and Financial Affairs, the deputy permanent secretary of the EPI (head of routine EPI service), the chairwoman of the NGO FESAIDE (Women Health and Development), and the head of the Technical Secretariat of the Steering and Monitoring Committee for health sector strategy implementation.

**Community members were mothers attending health clinics, individuals at community meeting places, and mixed groups of men and women meeting in a community space.

ANNEX 4: IDENTIFYING AND CONFIRMING RI PERFORMANCE DRIVERS

Figure 19. Process of the operations of analysis

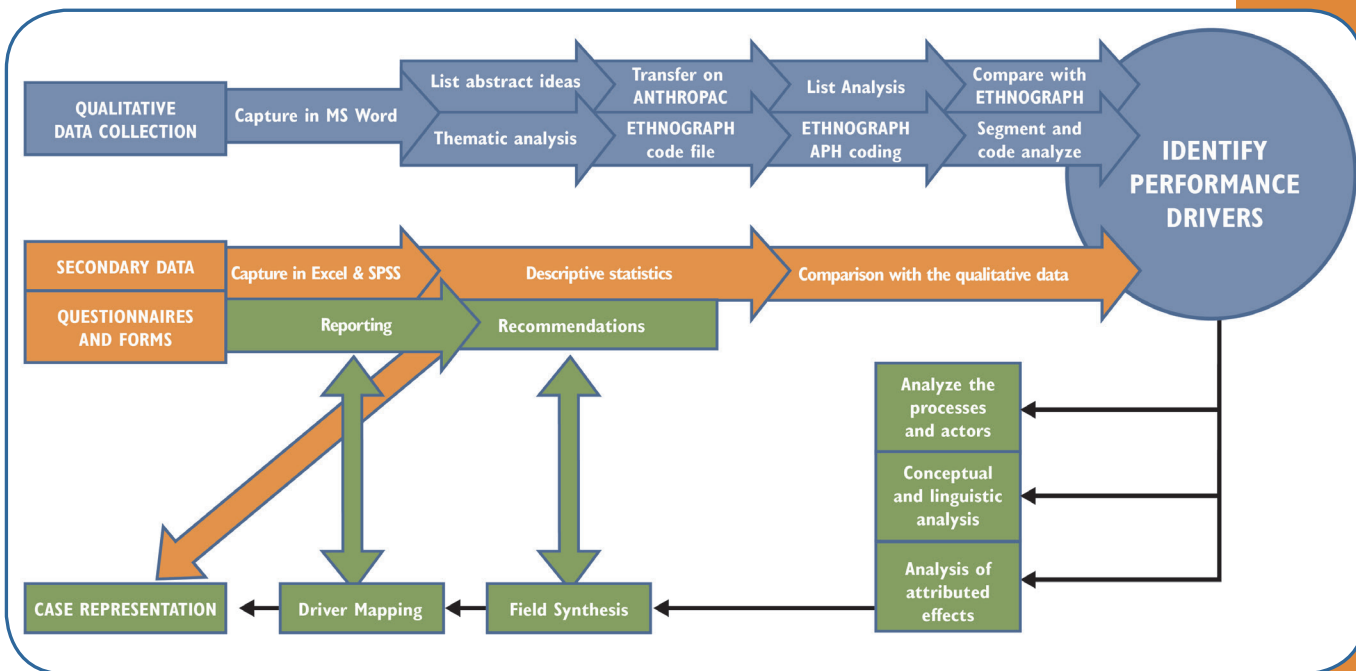
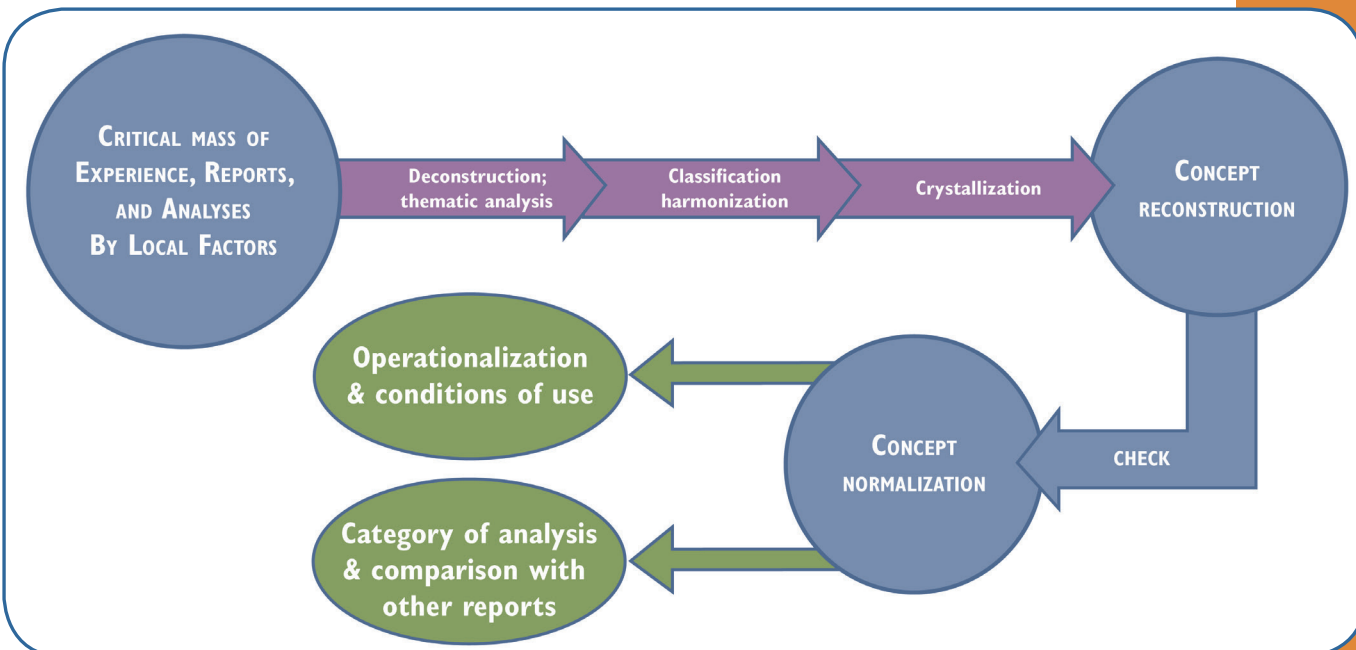


Figure 20. Review of existing references and subsequent driver construction



ANNEX 5: FREE LISTING RESPONSES BY DISTRICT

Table 21. Success factors mentioned at the central level

SUCCESS FACTORS MENTIONED	FREQUENCY (%)	AVERAGE RANK	SALIENCE
Political will	66.7	1.75	0.576
Training	58.3	3.71	0.304
Planning	41.7	3.6	0.272
Coordination	41.7	4.6	0.201
Support of international partners	41.7	4.2	0.198
Availability of the vaccine	33.3	2	0.286
Supervision	33.3	5.25	0.125
SASNIM	25	2.33	0.198
Performance contracts	25	3.33	0.126
Community mobilization	25	4.33	0.106
Advocacy	16.7	3,5	0.115
Governance	16.7	3,5	0.094
Multisector approach	16.7	2	0.146
RED approach	16.7	5	0.076
Evaluation	16.7	6	0.038
Building of health centers	8.3	8	0.01
Activity decentralization	8.3	2	0.073
Availability of refrigeration equipment	8.3	3	0.065
Commitment of the staff	8.3	1	0.083
Sensitization	8.3	5	0.028
Advanced strategy	8.3	4	0.056
Involvement of the private sector	8.3	9	0.009
Inclusion in state	8.3	3	0.042
Involvement of the private sector	8.3	6	0.031
Financial incentives	8.3	4	0.042
Motivation of staff	8.3	3	0.06
Comprehensive services	8.3	5	0.017
Availability of human resources	8.3	5	0.042

Table 22. Success factors mentioned in Kribi

SUCCESS FACTORS	FREQUENCY (%)	AVERAGE RANK	SALIENCE
Sensitization	50	2	0.377
Availability of staff	50	2.63	0.343
Community mobilization	37.5	3.67	0.195
Planning	37.5	2	0.3
Human qualities of health worker	37.5	2	0.281
Availability of the vaccine	25	5	0.091
Monitoring	25	5.5	0.094
SASNIM	18.8	4	0.097
Style of work	18.8	4.33	0.1
Availability of logistics	18.8	5	0.064
Staff motivation	12.5	3.5	0.057
Creation of fixed positions	12.5	4.5	0.049
Outreach strategy	12.5	2	0.099
Involvement of the private sector	12.5	4.5	0.07
Coordination	12.5	3	0.088
Reputation of the health facility	6.3	2	0.047
Stability of personnel	6.3	3	0.038
Zoning	6.3	2	0.047
Reception in the facilities	6.3	2	0.042
Availability of refrigeration equipment	6.3	5	0.031
Accessibility of the services	6.3	4	0.042
Weighing of children	6.3	6	0.01
Raising of local resources	6.3	4	0.039
Personnel commitment	6.3	5	0.021
Training	6.3	4	0.25

Table 23. Success factors mentioned in Ndop

SUCCESS FACTORS	FREQUENCY (%)	AVERAGE RANK	SALIENCE
Availability of personnel	50	3	0.36
Community mobilization	50	3	0.329
Coordination	37.5	3.67	0.211
Sensitization	37.5	2.67	0.198
Planning	37.5	5.67	0.085
Reception in health facilities	37.5	2.67	0.246
Motivation of personnel	25	3.5	0.146
Training	25	6.5	0.091
Availability of means of transportation	25	4	0.164
Weighing of children	25	2	0.167
Outreach strategies	12.5	3	0.063
Follow up/tracing of defaulters	12.5	3	0.1
Style of work	12.5	2	0.1
Supervision	12.5	10	0.013
Human qualities of health agent	12.5	2	0.083
Zoning	12.5	7	0.05
Good governance	12.5	7	0.018
Building new health centers	12.5	1	0.125
Financial autonomy	12.5	9	0.025
Committed personnel	12.5	1	0.125
Availability of the vaccine	12.5	1	0.125
Availability of refrigeration equipment	12.5	4	0.087
Availability of the drug	12.5	4	0.071

Table 24. Success factors mentioned in Bali

SUCCESS FACTORS	FREQUENCY (%)	AVERAGE RANK	SALIENCE
Community commitment	81.8	256	0.585
Human qualities of the health worker	36.4	2.75	0.284
Staff commitment	36.4	3,5	0.221
Reception in the facilities	36.4	5,5	0.117
Training	27.3	3.33	0.17
Researching absentees	27.3	3.67	0.173
Sensitization	27.3	1.33	0.227
Involvement of private sector	18.2	7.5	0.036
Follow-up of pregnant women	18.2	2	0.145
Planning	18.2	2.5	0.148
Supervision	18.2	8.5	0.3
Care of children	18.2	3.5	0.077
Zoning	18.2	5	0.092
Availability of refrigeration equipment	18.2	3	0.139
Good governance	18.2	6.5	0.038
Availability of the vaccine	18.2	3.5	0.091
Support from the province	9.1	6	0.034
Financial autonomy of health centers	9.1	7	0.3
Accessibility of services	9.1	1	0.091
Availability of logistics	9.1	5	0.051
Coordination	9.1	2	0.061
Availability of personnel	9.1	3	0.071
Outreach activities	9.1	2	0.068
Knowledge of immunization	9.1	3	0.03

Table 25. Positive and negative factors mentioned in Bafang

SUCCESS FACTORS	FREQUENCY (%)	AVERAGE RANK	SALIENCE
Motivation of the staff	60	1.33	0.56
Community mobilization	40	1	0.4
SASNIM	40	3.5	0.18
Availability of transportation	40	2	0.283
Availability of vaccine	40	3.5	0.117
Door to door	20	1	0.2
Search for dropout	20	3	0.12
Outreach strategies	20	5	0.04
Town crier	20	2	0.1
Involvement of administrative authorities	20	2	0.133
Commitment of the staff	20	3	0.067

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AFRICA ROUTINE IMMUNIZATION SYSTEM ESSENTIALS



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