Enhanced Clinical Outcomes and Disease Trend Monitoring

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Executive Chairman

Adamawa State Primary Health Care Development Agency

• Introduction

✓ Background information

Indicator	Switzerland	Nigeria	Afghanistan	South Sudan	Somalia
Total population (2015)	8,299,000	182,202,000	32,527,000	12,340,000	10,787,000
Gross national income per capita (PPP international $, 2013)	56	5	2	2	N/A
Life expectancy at birth m/f (years, 2015)	81/85	53/56	59/62	56/59	54/57
Probability of dying between 15 and 60 years m/f (per 1 000 population, 2015)	61/37	368/318	284/239	351/313	340/283
Total expenditure on health per capita (Intl $, 2014)	6,468	217	167	73	N/A
Total expenditure on health as % of GDP (2014)	11.7	3.7	8.2	2.7	N/A

SOURCE: www.who.int

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✓ Background information

CHILD MORTALITY			
Early childhood mortality			
MICS Indicator	**Indicator**	**Description**	**Value**
1.1 SDG 3.2.2	**Neonatal mortality rate**	**Probability of dying within the first month of life**	**39**
1.2 MDG 4.2	**Infant mortality rate**	**Probability of dying between birth and the first birthday**	**70**
1.3	**Post-neonatal mortality rate**	**Difference between infant and neonatal mortality rates**	**31**
1.4	**Child mortality rate**	**Probability of dying between the first and the fifth birthdays**	**54**
1.5 SDG 3.2.1	**Under-five mortality rate**	**Probability of dying between birth and the fifth birthday**	**120**
Indicator values are per 1,000 live births and refer to the 5-year period preceding the survey			

SOURCE: Nigeria Multiple Cluster Indicator Survey (MICS) 2016-17; August 2017

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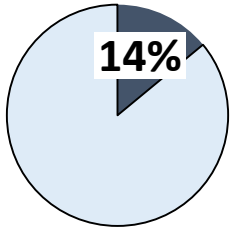
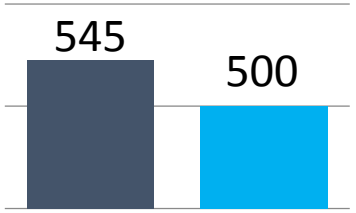
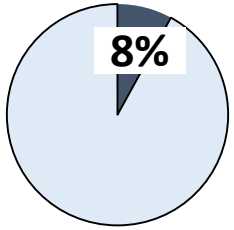
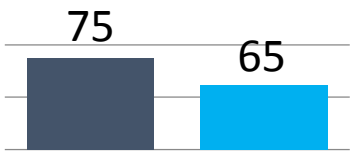
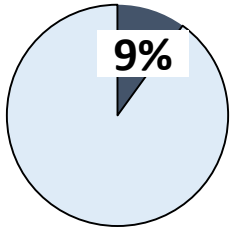
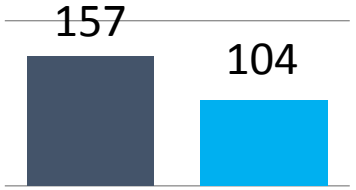
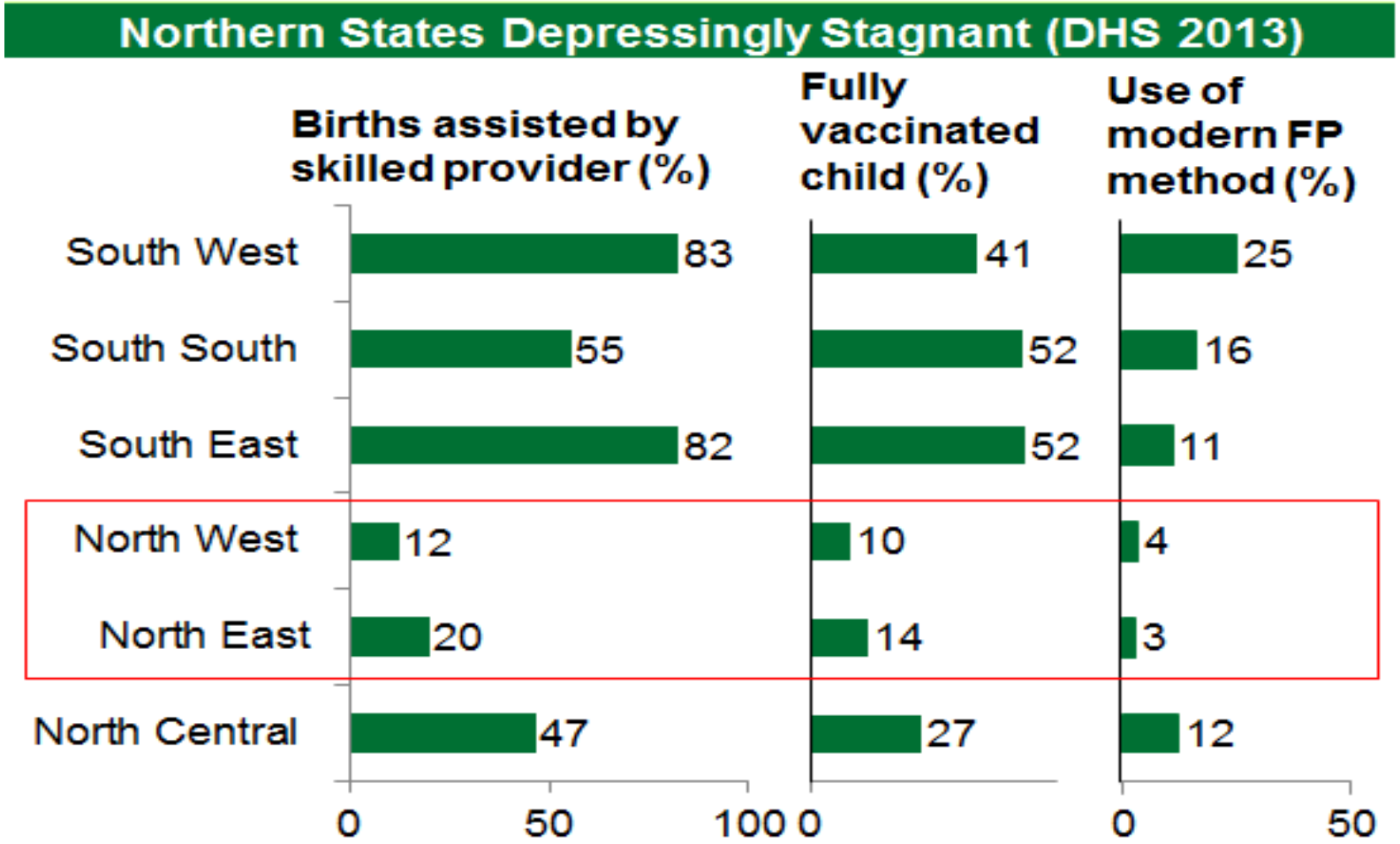
	Nigeria's global share	Nigeria Vs. SSA	Description
Maternal mortality rate (100k live births)	 		• 33,000 women each year
Infant mortality rate (1000 live births)	 		• An estimated 70% of these deaths are preventable
Under 5 mortality rate (1000 live births)	 		• ~ 1 million deaths each year

SOURCE: FMOH Presentation (NDHS 2008), Rajaratnam et al. 2010, UN Report 2012

- # Introduction
  - ✓ Background information



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What you will see at a primary health care center:

- Relatively abundant workers (among top in SSA)
- Chronic stock-outs of essential drugs (Avg. 55%)
- Lack of minimum equipment (Avg. 25% equipped)
- Poor sanitation/waste management
- Idle health workers/absenteeism (Avg. 29%)
- **Correct mgmt. of maternal and child complication (17.3%)**
- **Low number of patients** (Avg. 1.5 patients per day)

Underlying systemic issues:

- **Fragmentation and poor coordination** between federal, state and local govt levels
- **Unclear accountability** and poor performance review to strengthen it
- **No incentives** to good or poor performance
- **No cash and autonomy** at health facilities

Source: Service Delivery Indicator (SDI) Survey, 2013

• Introduction

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Health Data Sources

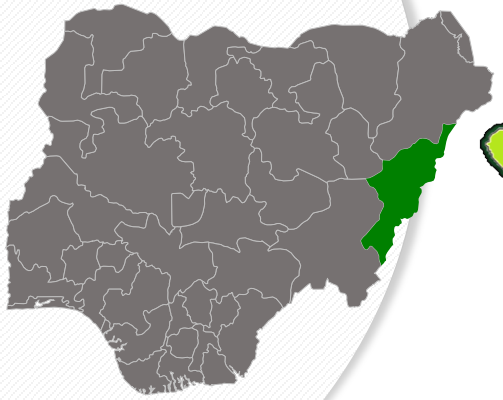
- **ADMINISTRATIVE coverage:**
  - Reported by national authorities and based on aggregated administrative reports from health service providers on the quantity of service provided during a given period (numerator data) and reported target population data (denominator data).
  - May be biased by inaccurate numerator and/or denominator data.
- **OFFICIAL coverage:**
  - Estimated coverage reported by national authorities that reflects their assessment of the most likely coverage based on any combination of administrative coverage, survey-based estimates or other data sources or adjustments.
  - Approaches to determine OFFICIAL coverage may differ across countries.
- **SURVEY coverage:**
  - Based on estimated coverage from population-based household surveys following a review of survey methods and results.
  - Information is based on the combination of reported events from documented evidence or caregiver recall.
  - Survey results are considered for the appropriate cohort based on the period of data collection.

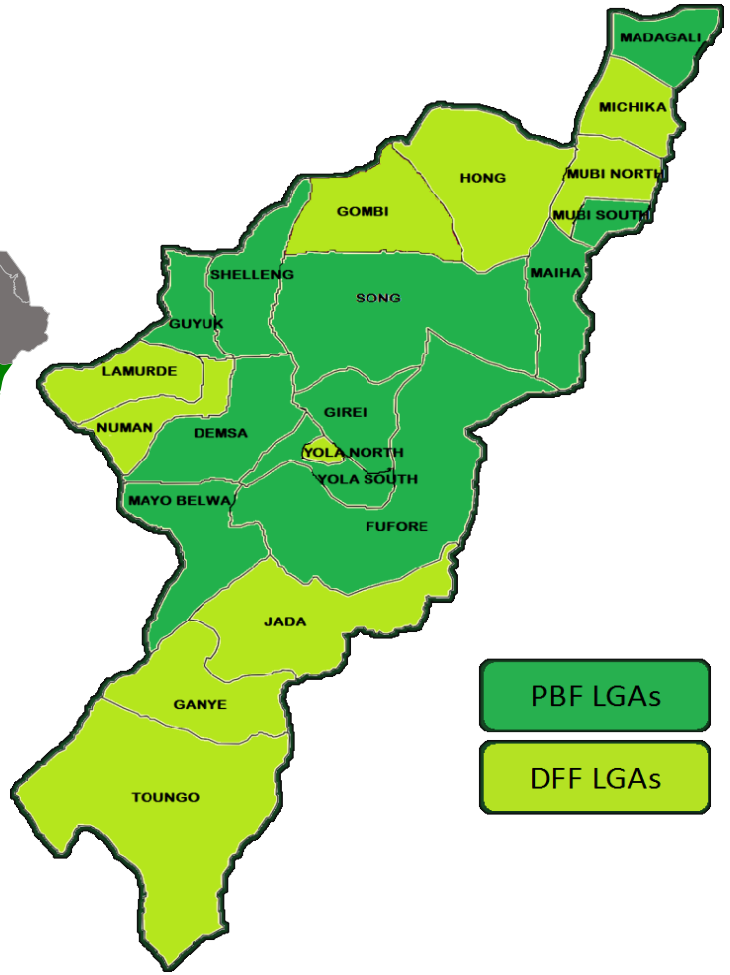
• Introduction

✓ Background information

Nigeria

Adamawa State





PBF LGAs

DFF LGAs

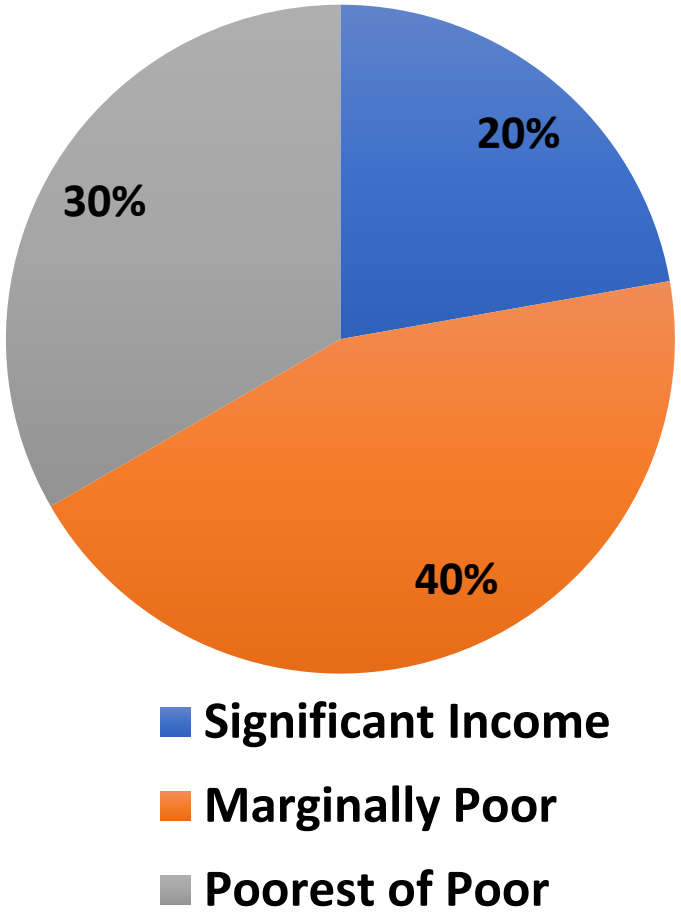
Founded: 27 August 1991
Area: 36,917 km²
Capital: Yola
GDP (2007): $4.58 billion
GDP Per Capita: $1,417
Source: Wikipedia

2018 Profile

- **4.4 Million People**
- **21 LGAs**
- **226 Wards**
- **1 Federal Medical Centre**
- **1 Specialist Hospital**
- **16 General Hospitals**
- **403 Health Teams**
- **7 Private Engagement**

• Introduction

✓ Background information

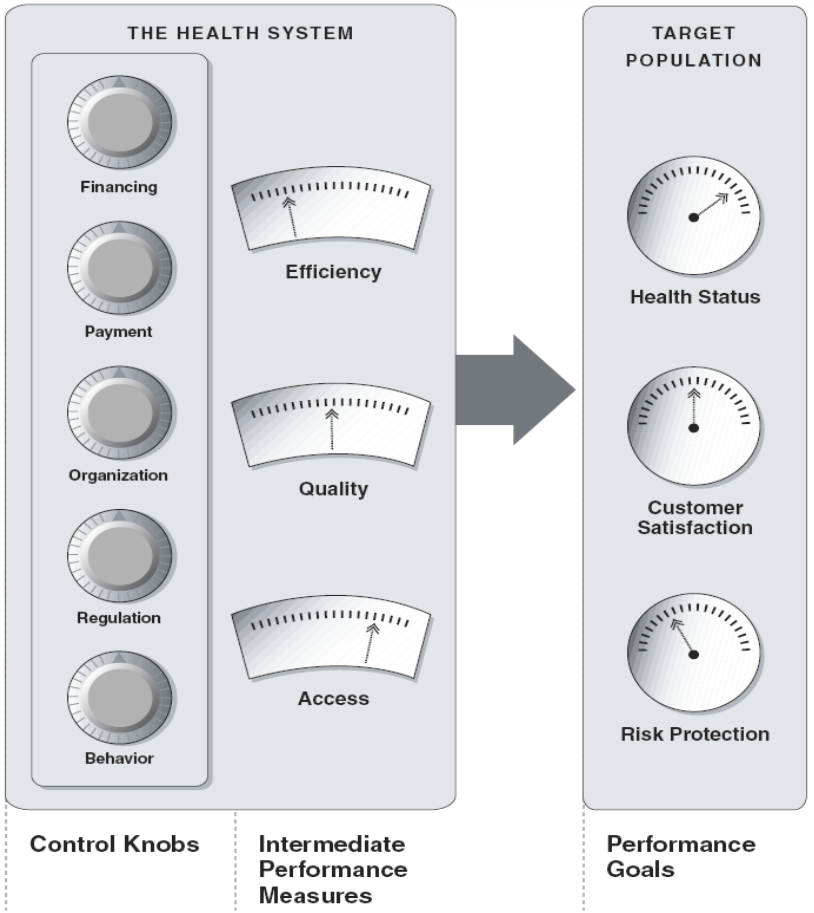


*** Note: The Adamawa state government has no efficient means of sending and receiving cross boarder payments in all 21 local governments. So citizens have to travel distances to transact. With high cash handling rate and high risk of cash movement

• Introduction

✓ Adamawa PHC System

- **Primary Health Care Services is treated as Commodity**
  - **Demand and Supply Side**
    - **Focused on population health**
    - **Social Protection is addressed through both demand and supply sides**
  - **Free Market theory**
- **System is designed and managed professionally**
  - **Universal Health Coverage in focus**
  - **Strengthened Ward Health System**
  - **Improved governance by PHCUOR**

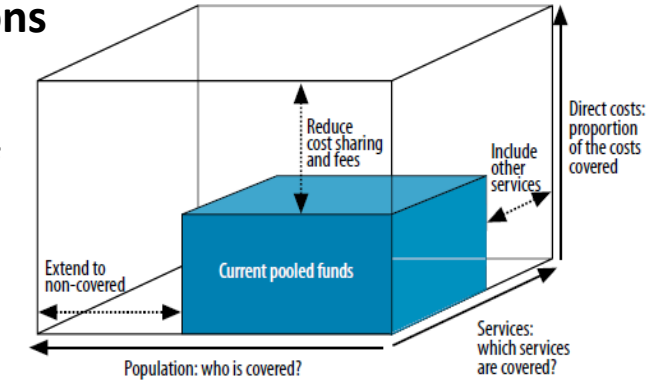


• Introduction

✓ Adamawa PHC System

Input/Output Based Financing Mixed MODEL System

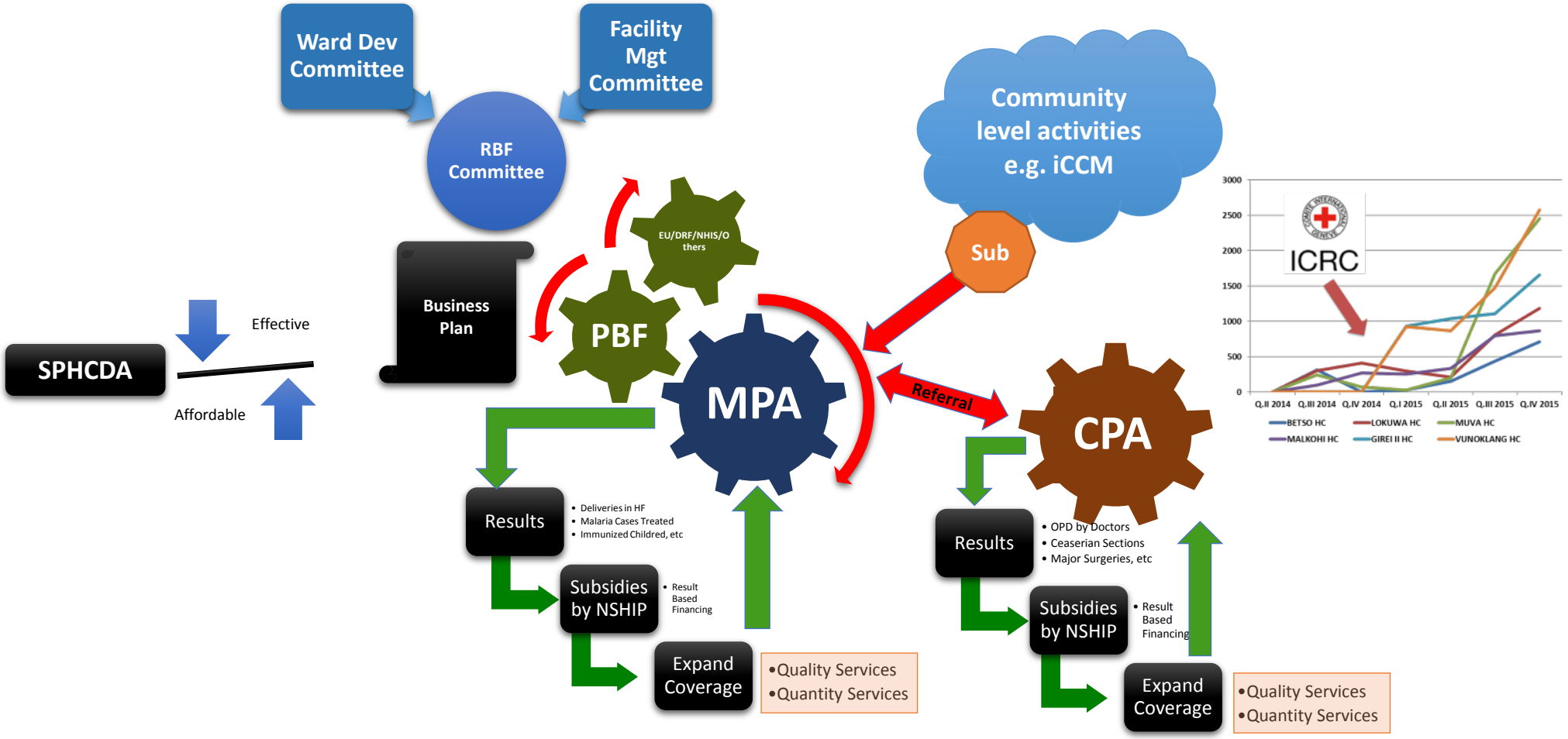
- **Performance Based Financing (PBF) Model's Assumptions**
  - **Predefined set of services with set targets**
  - **Targets based on static population**
  - **Clearly defined institutional arrangement with separation of functions**
  - **Contracted facilities have minimum required capacity**
    - **Work Space**
    - **Staff**
    - **Equipment**
  - **Contracted facilities have autonomy to**
    - **Hire and fire**
    - **Use cash**
    - **Procure locally**
  - **Budget of at least $3/capita ($2 subsidies, $1 overheads)**
- **Input Based Financing – Result focused**
  - **Strengthening Capacity to deliver results – Planning, Trainings, Supervision**
  - **Further subsidizing services – Drugs and Consumables, Outreaches**
  - **Empowering the vulnerable – Conditional CT, Transport Vouchers**



- # Introduction

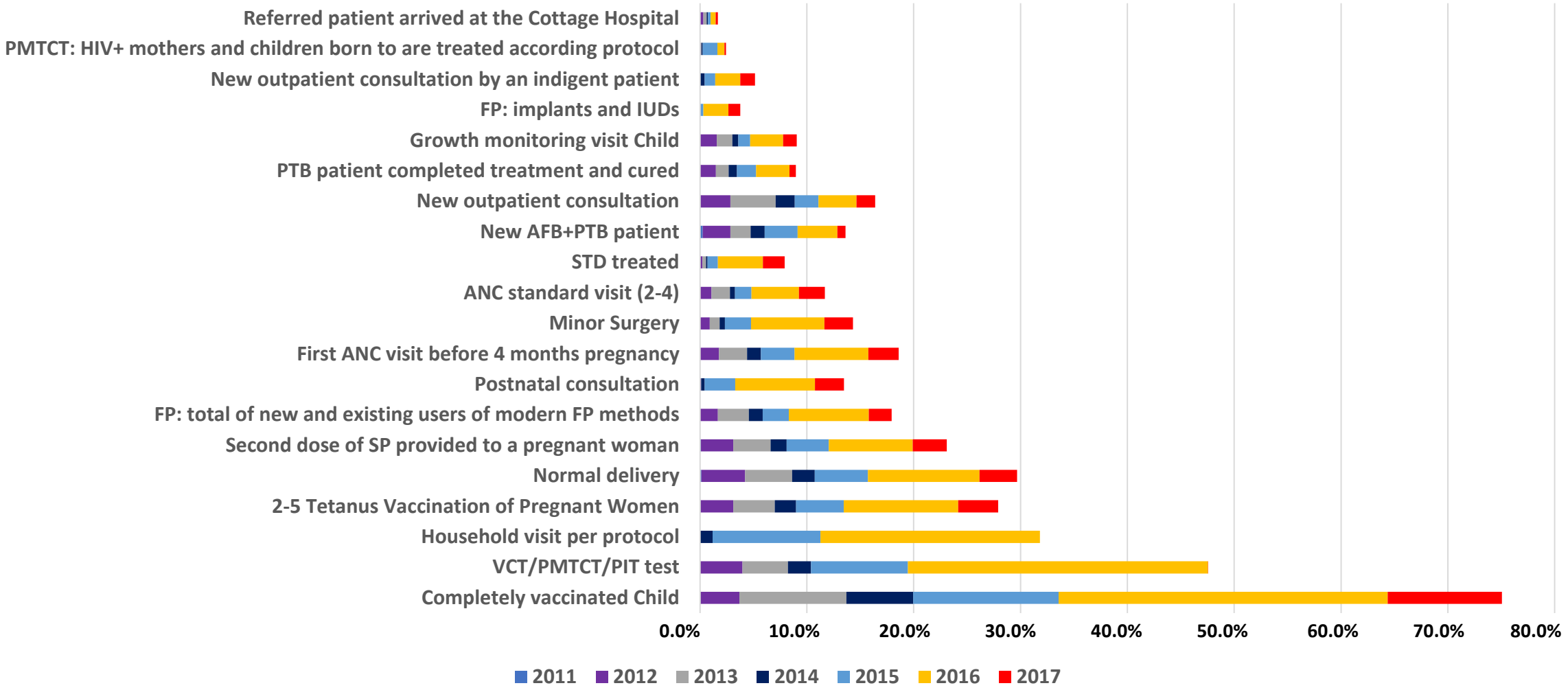
✓ Adamawa PHC System

Strengthened Ward Health System Approach



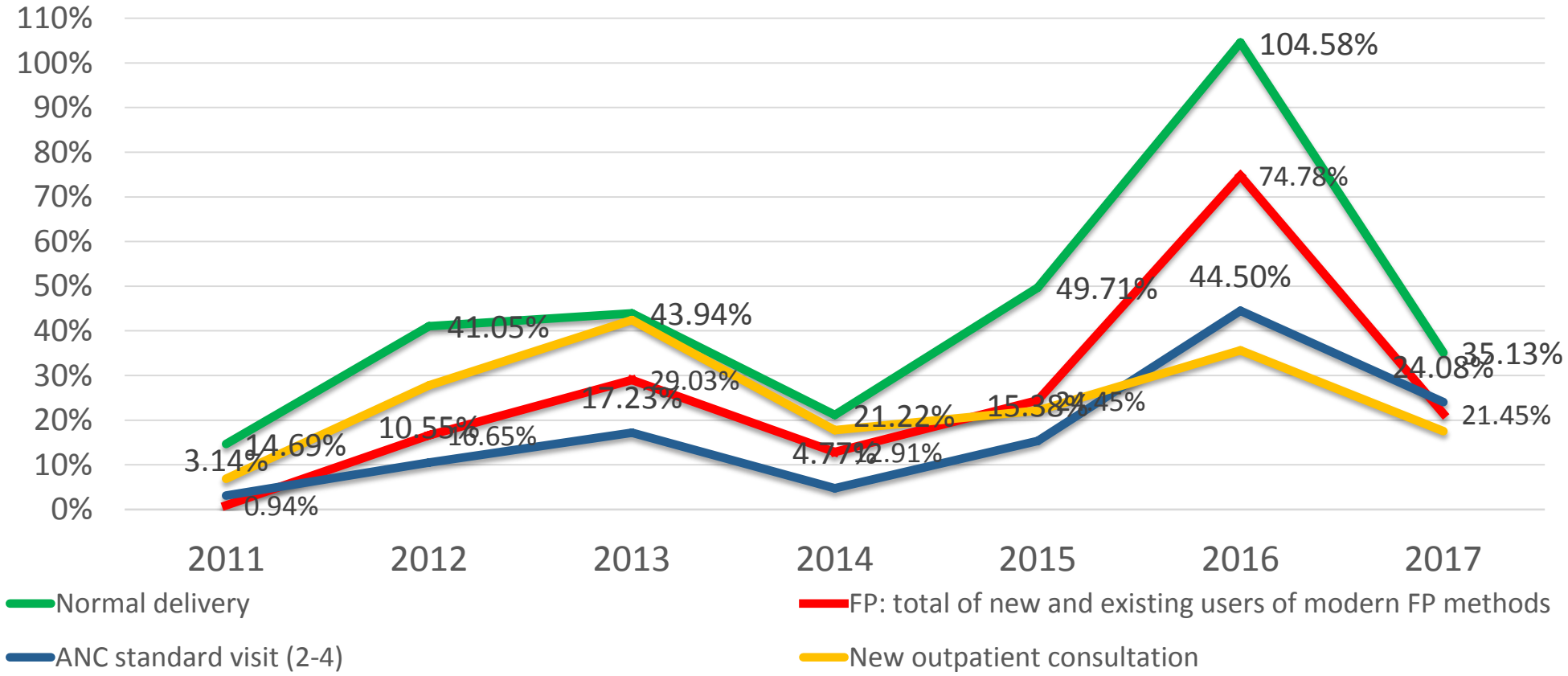
- Challenges
  - ✓ Results of Quantity Coverage

Evolution of all MPA Indicators from Inception



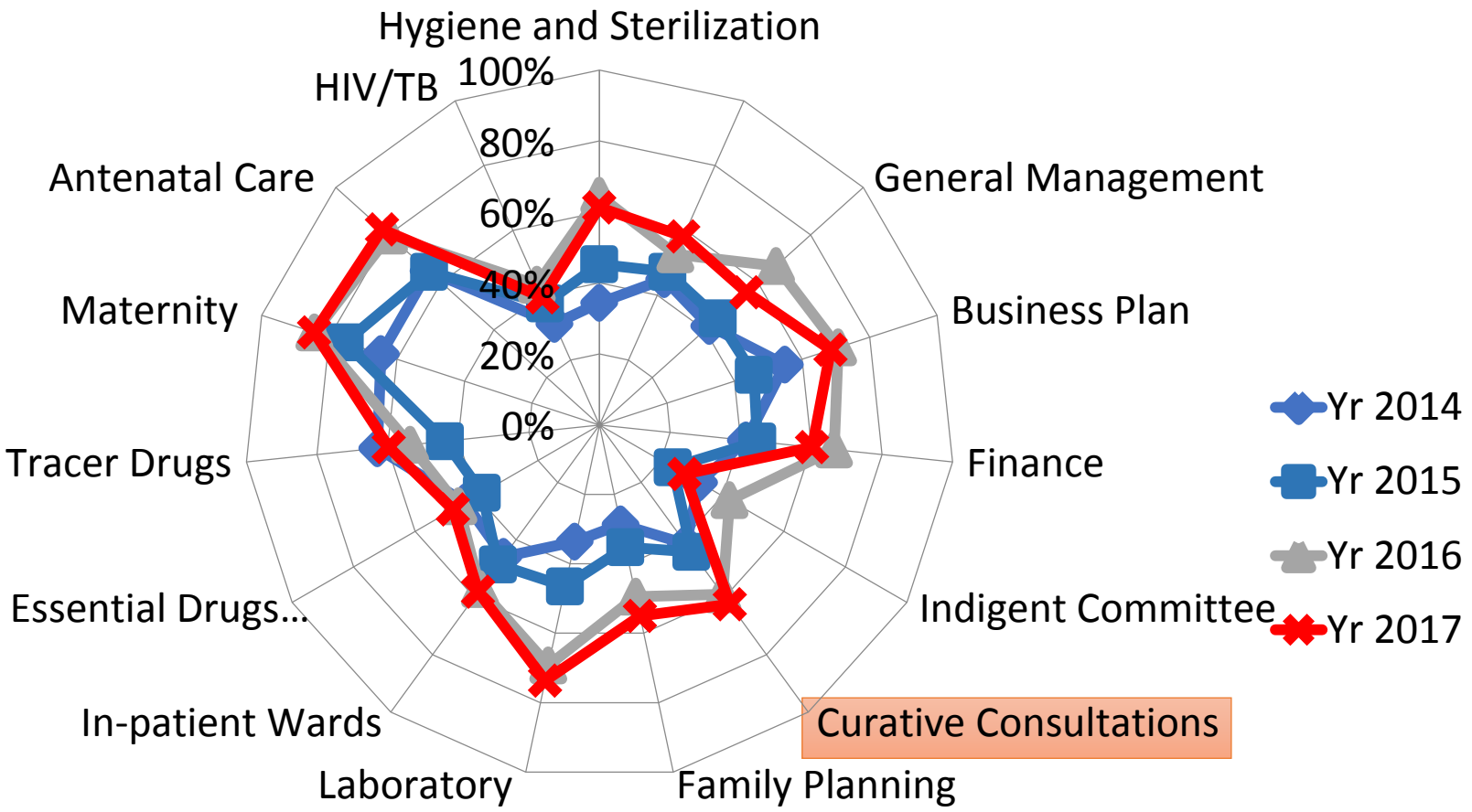
- Challenges
  - ✓ Results of Quantity Coverage

Evolution of key MPA indicators from inception

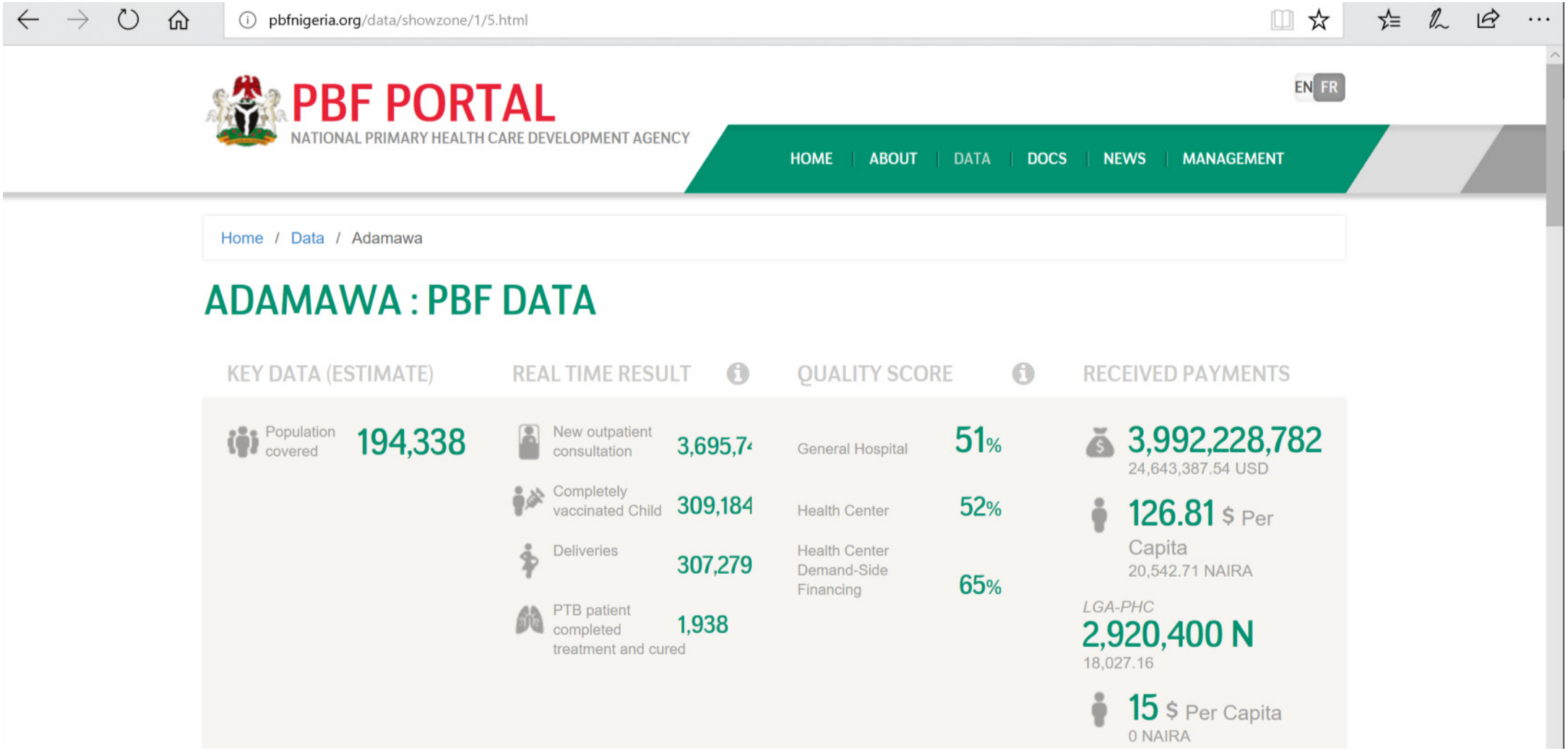


- Challenges
  - ✓ Results of Quality Coverage

Evolution of State Quality



- # Challenges
  - ✓ Results of State NSHIP Dashboard



- # Challenges
  - ✓ Results of State IDSR

Adamawa State

Integrated Disease Surveillance and Response (IDSR)

Nigeria Emergency Response

Week 52 2017 (Dec 25 – Dec 31)

SURVEILLANCE | *Performance Indicator - Weekly*

21	21	147	6	100%	99.8%
Number of LGA	Number of LGA that report IDSR	No of recognized surveillance focal sites	No of surveillance focal sites in IDP camps and vulnerable communities	Completeness of reporting by LGAs	Timeliness of reporting by LGAs

Alerts | *Week 52*

07	100%	0
Total alerts received*	% alerts investigated	# alerts requiring response

- Alerts are sent from the health facilities to the LGA DSNOs through the normal reporting of **health facility level IDSR data**. No data on timeliness and completeness of reporting by Health facilities.
- 05 AFP cases, 01 suspected Measles and a case of suspected Yellow Fever making a total of 07 Alerts.

- # Challenges
  - ✓ Results of State IDSR

Immediately notifiable diseases | *IDSR 002*

Table 1

Disease	Week 52		Cumulative 2017	
	# cases	# deaths	# cases	# deaths
AFP	05	0	600	0
Measles	01	0	707	04
Meningitis	0	0	25	2
Cholera	0	0	0	0
Viral Haemorrhagic Fever	0	0	6	2
Yellow Fever	01	0	17	0
Guinea worm	0	0	0	0
Human Influenza	0	0	0	0

- # Challenges
  - ✓ Results of State IDSR

Trend of Epidemic prone diseases | Suspected Measles

Fig. 1a Trend of weekly number of Suspected Measles cases, Week 1 – 52, 2017.

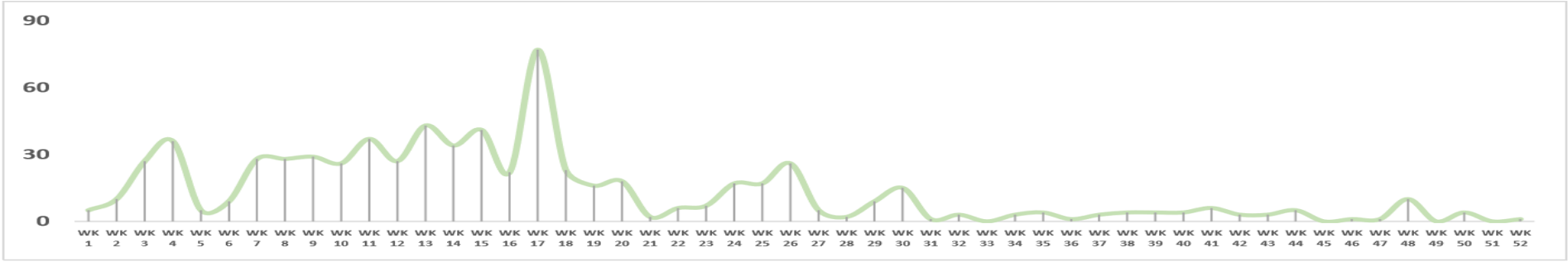
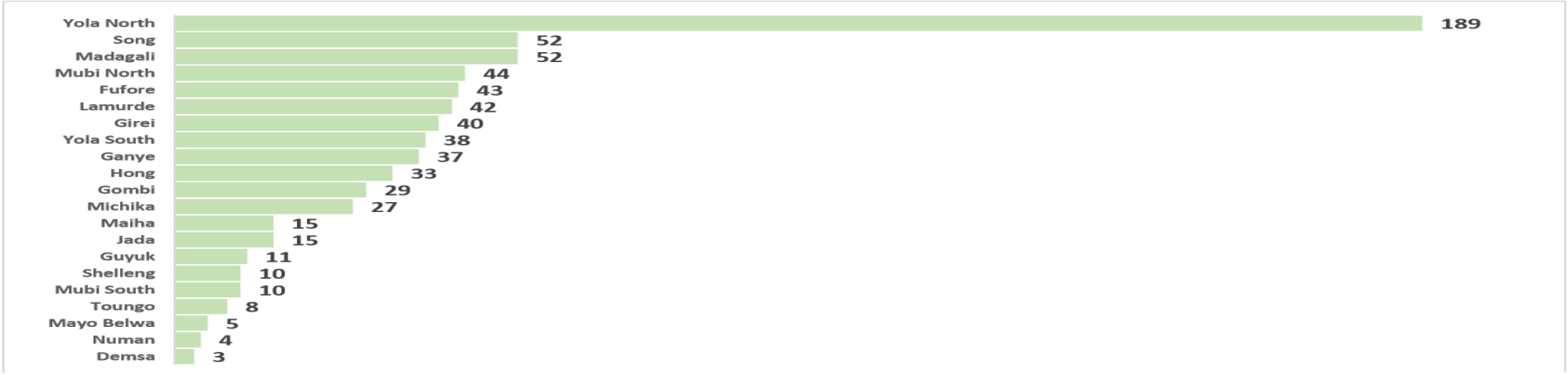


Fig 1b. Number of Suspected Measles cases by LGA, Week 1 – 52, 2017.



- # Challenges
  - ✓ Results of State IDSR

Trend of Epidemic prone diseases | Suspected Cerebrospinal Meningitis(CSM)

Fig 2a. Weekly trend of suspected cases of CSM, Week 1 – 52, 2017.

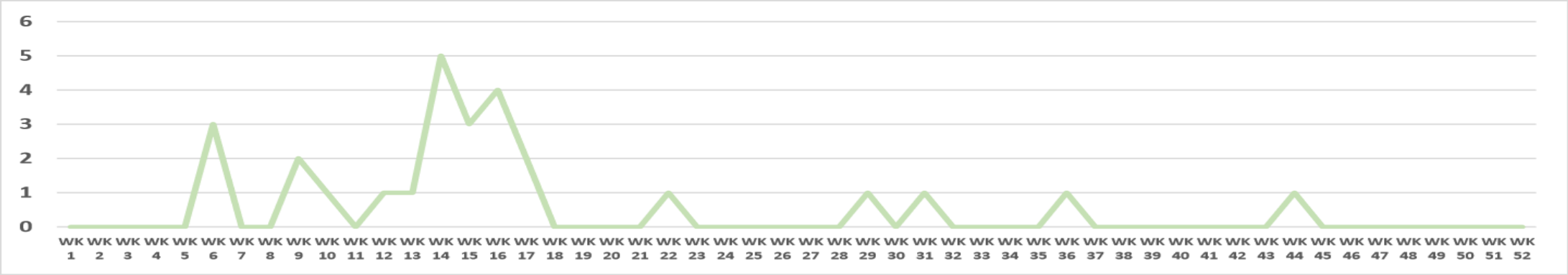
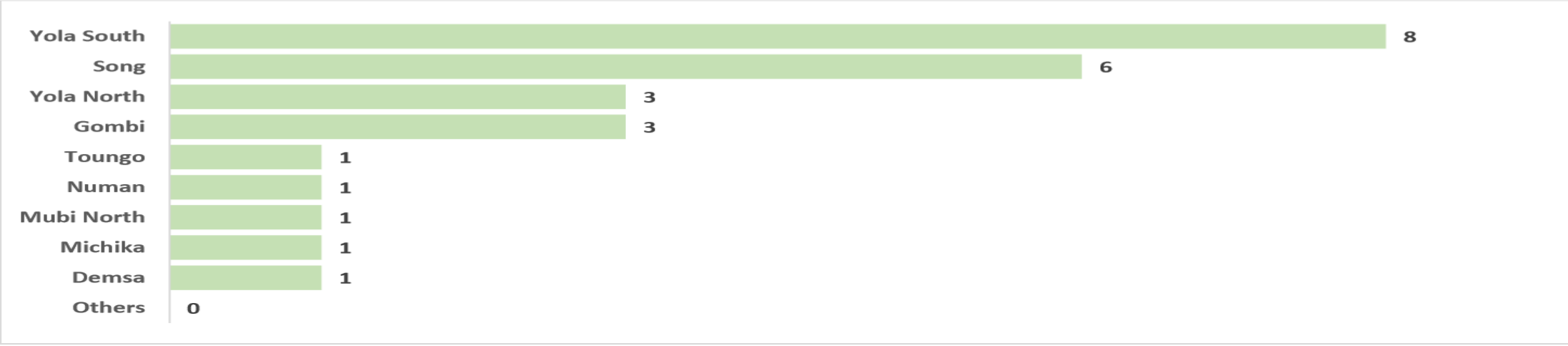


Fig 2b. Number of suspected CSM cases by LGA, Week 1 – 52, 2017.



- # Challenges
  - ✓ Results of State IDSR

Trend of Diseases Targeted for Elimination | AFP Cases

Fig 4a. Weekly trend of AFP Cases, Week 1 – 52, 2017.

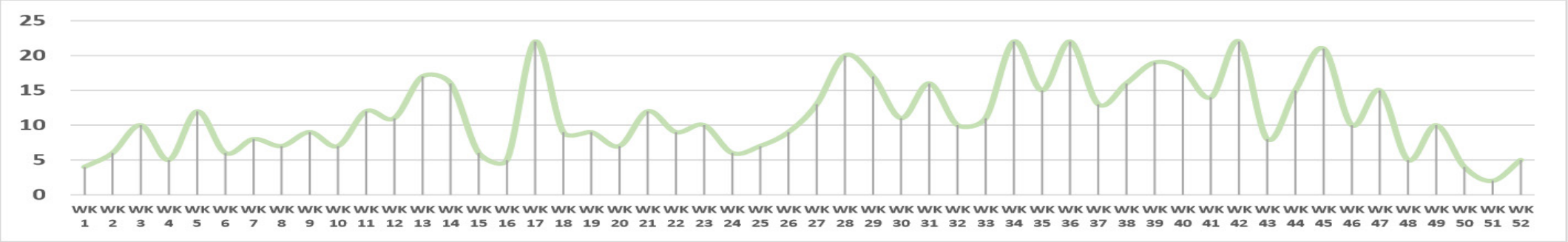
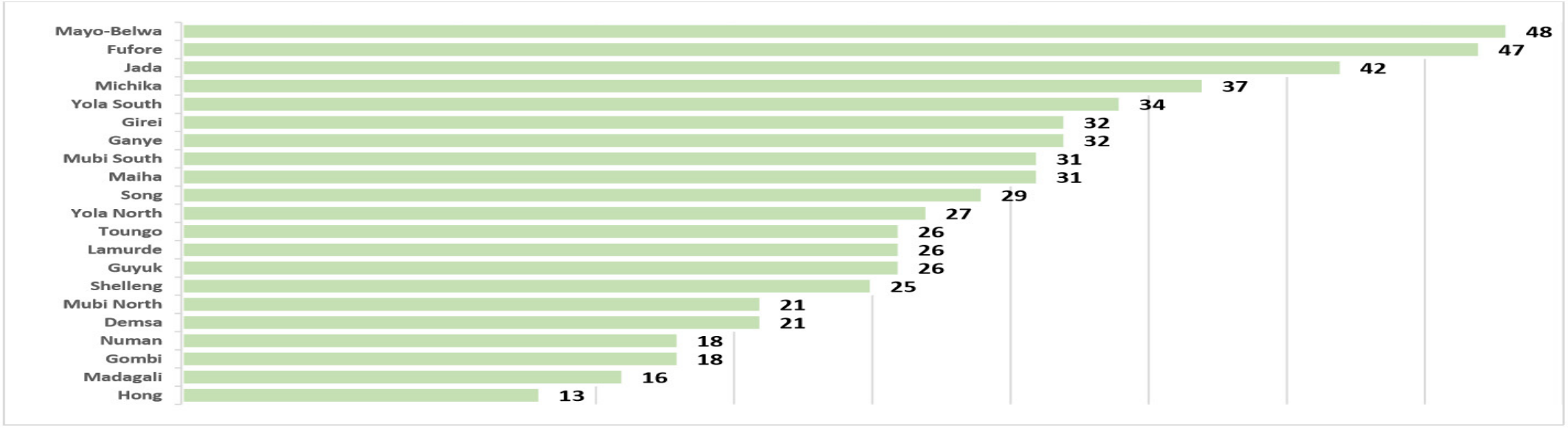
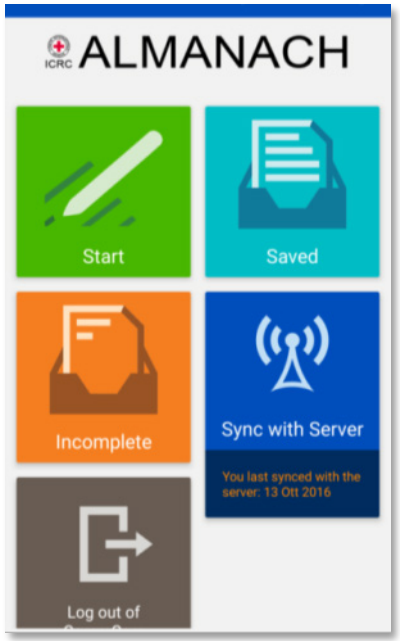


Fig 4b. Number of AFP Cases by LGA, Week 1 – 52, 2017.



- # Solutions
  - ✓ Improve Clinical Quality

- **Improve quality of curative consultations**
  - **Basically, replacing the PHC "Standing Order"**
    - **Children – Algorithm for the management of child health (ALMANACH)**
    - **Others – Practical approach to clinical care kit (PACK/ePACK)**



- Solutions
  - ✓ ALMANACH

- **Algorithm for the Management of Childhood Diseases**
  - **Transformation of the Integrated Management pf Childhood Illnesses (IMCI) to simplified logical algorithm**
  - **Transformation of the algorithm to powerful electronic clinical tool**
  - **Powerful job aid suitable for low level staff responsible for high volume clinical work**
  - **ALMANACH use improves clinical outcome and reduces antibiotic prescription by 80%**
  - **The building on mobile technology allows easy access and rapid update of the decision chart without need for additional trainings**

- Solutions
  - ✓ ALMANACH

Table1. Key differences between the IMCI and the new ALMANACH

	IMCI algorithm	New algorithm (ALMANACH)
Danger signs	5 danger signs managed at the start: unable to drink or breastfeed; lethargic or unconscious; vomits everything; convulsing now or has had convulsions Six additional danger signs assessed later: stridor; chest indrawing; sunken eyes; skin pinch goes back very slowly; stiff neck; tender swelling behind ear	10 danger signs managed at the start: unable to drink or breastfeed; lethargic or unconscious; jaundice; vomits everything; convulsing now or has had convulsions; cyanosis; severe pallor; stiff neck and severe wasting Six additional danger signs assessed later: stridor; chest indrawing;; sunken eyes; skin pinch goes back very slowly; tender swelling behind ear; infected skin lesion or lump larger than 4 cm or with red streaks or with tender nodes or multiple abscesses
Fever	1 out of 4 Main symptoms	A dividing point between a febrile branch and a non- febrile branch
Pneumonia	Cough + fast breathing[a]	Fever + cough + very fast breathing[b]
Urinary Tract Infection	Not considered	Febrile child<2 years with no source identified at this point[c], and with a positive (leucocytes or nitrites) urine dipstick.
Typhoid fever	Not considered	Febrile child ≥2 years with no source identified at this point[c], and with abdominal tenderness
Likely viral infection	Not existing	Febrile child with no classification at the end of the algorithm

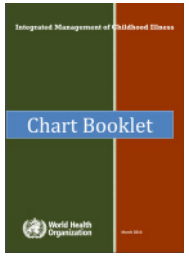
[a] 50 breaths/min for children aged 2 to 12 months, 40 breaths/min for children aged 12 months to 5 years.

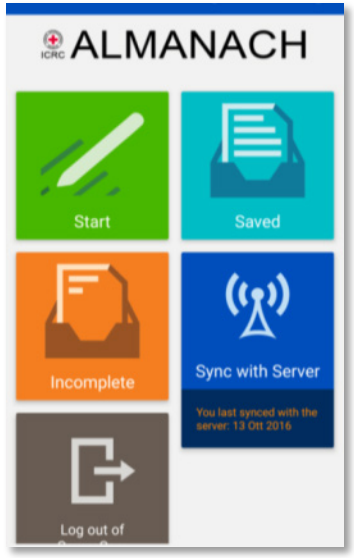
[b] 50 breaths/min for all children (aged 2 months to 5 years).

[c] No cough or difficult breathing, no diarrhea, no ear problem, no measles, no infected skin lesion or lump.

doi:10.1371/journal.pone.0132316.t001

- # Solutions
  - ✓ ALMANACH-Elements and Scenarios for a scaling up in ADAMAWA state





ICRC

Swiss TPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut

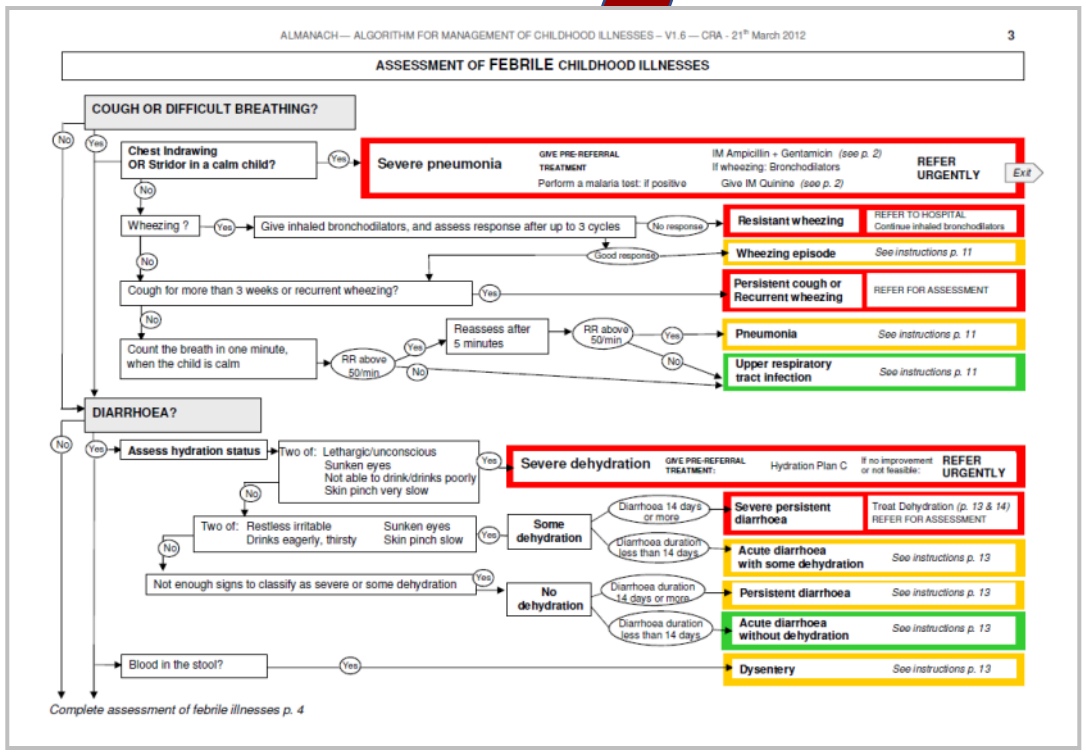
- # Solutions
  - ✓ ALMANACH-Electronic Version

paper-ALMANACH

a complex paper algorithm…

electronic-ALMANACH

android application
for smartphones and tablets



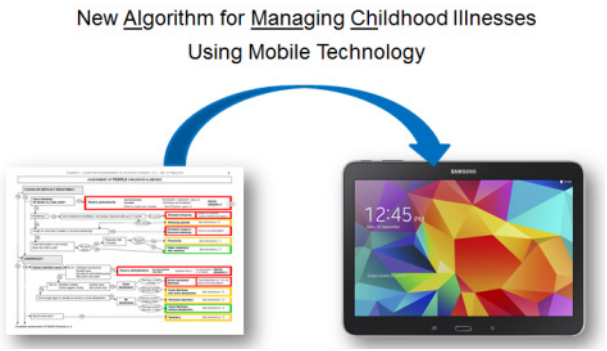
• Solutions

✓ ALMANACH-Description of the mHealth solution and current state of implementation

- ALMANACH is a clinical decision-support & MI-system:
  - health workers are guided through consultations based on an enhanced version of the IMCI from WHO,
  - to make consistent diagnostic and treatment decisions

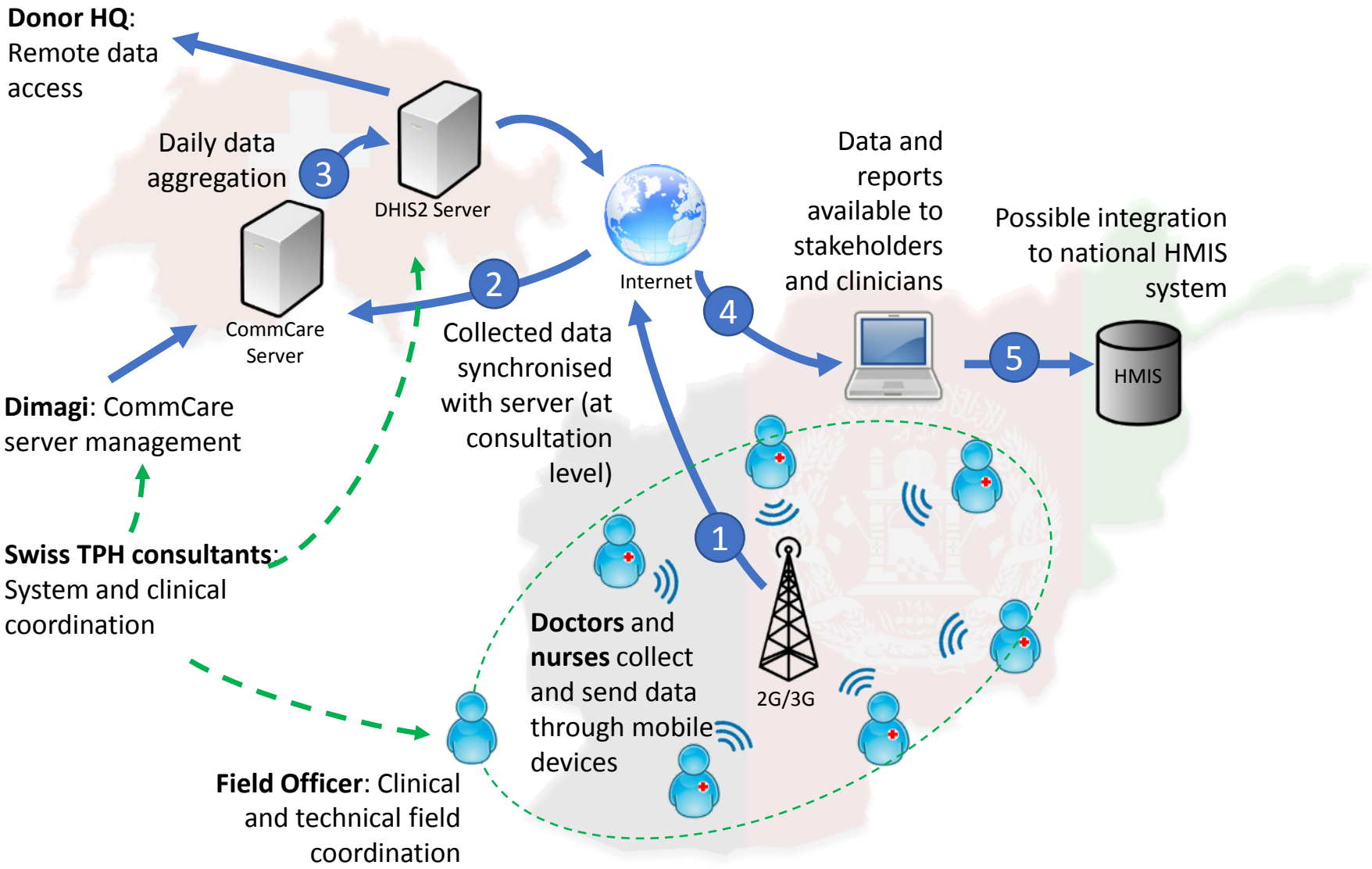
- Current state of implementation:
  - 1 central server in Switzerland hosting the application
  - Adamawa: 12+ clinics / 10’000+ consultations (52% coverage)

- Next step:
  - Proposed scale up project in Adamawa state, Nigeria

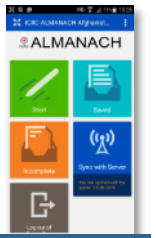


- # Solutions

✓ ALMANACH-System architecture



- # Solutions
  - ✓ ALMANACH-Health Data Management



ALMANACH

Search apps

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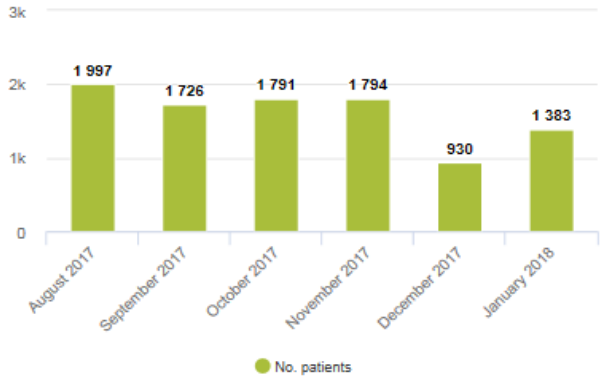
NGA DEM: Monthly trend

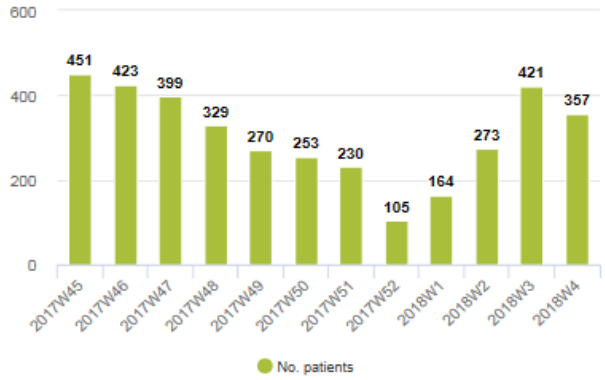
Nigeria



Explore | Resize | Share interpretation | Remove

NGA DEM: Patients in the last 12 weeks

Nigeria



Explore | Resize | Share interpretation | Remove

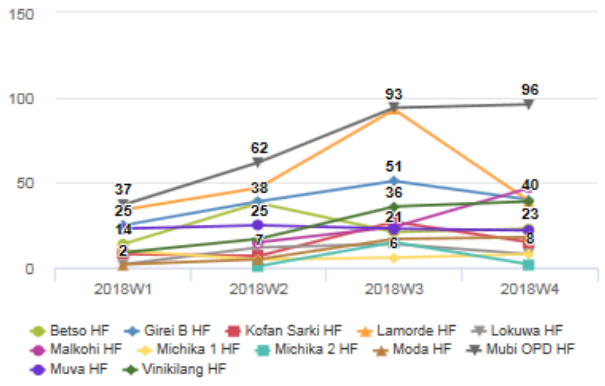
NGA DEM: Gender ratio

Nigeria				
Period / Data	No. female patients	No. male patients	% female patients	% male patients
February 2017	243	318	43.3	56.7
March 2017	442	533	45.3	54.7
April 2017	283	349	44.8	55.2
May 2017	202	302	40.1	59.9
June 2017	289	298	49.2	50.8
July 2017	788	972	44.8	55.2
August 2017	909	1 088	45.5	54.5
September 2017	830	896	48.1	51.9
October 2017	803	988	44.8	55.2
November 2017	816	978	45.5	54.5

Explore | Resize | Share interpretation | Remove

NGA DEM: Patients in the last 4 weeks

No. patients



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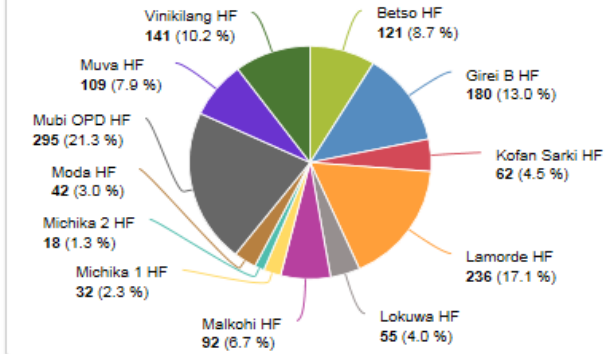
NGA DEM: Avg age (in months) yearly

Period	Organisation unit / Data	Avg. age (in months)
2017	Nigeria	24.2
2018	Nigeria	26.6

Explore | Resize | Share interpretation | Remove

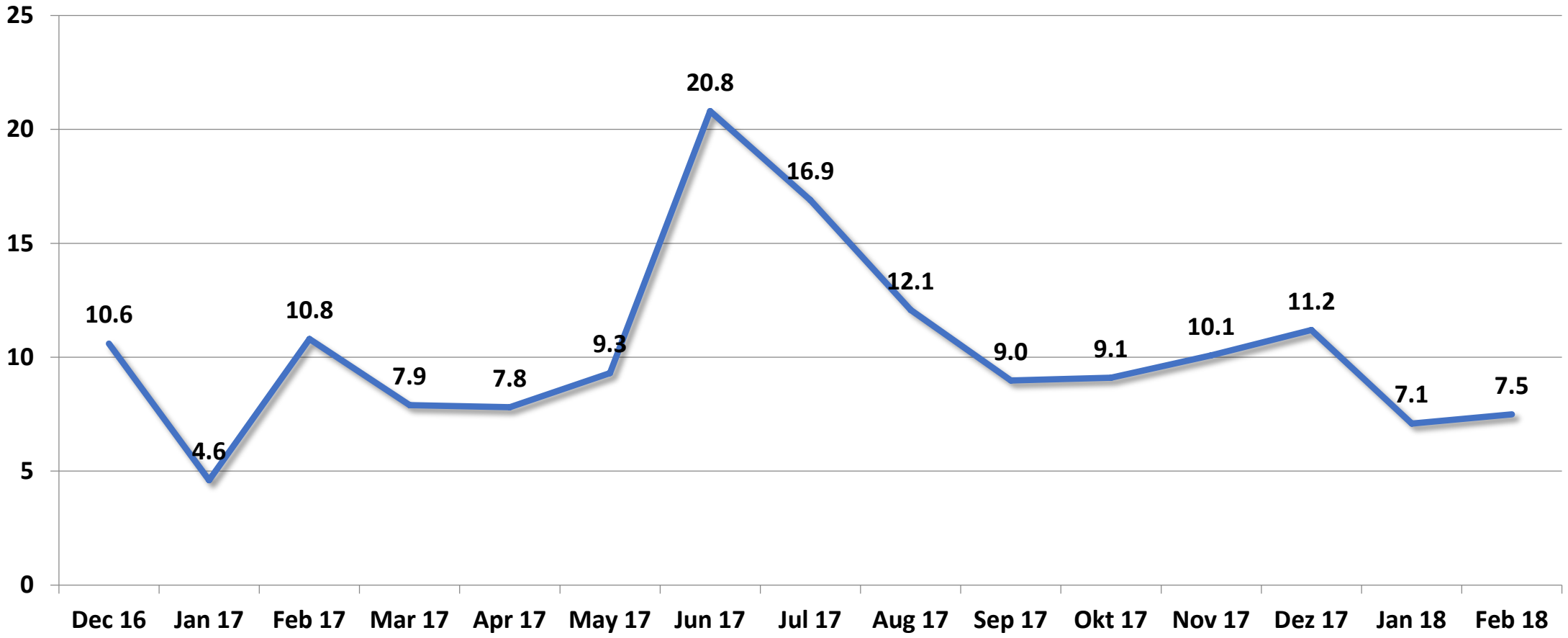
NGA DEM: Total patients per year pie chart

No. patients - 2018

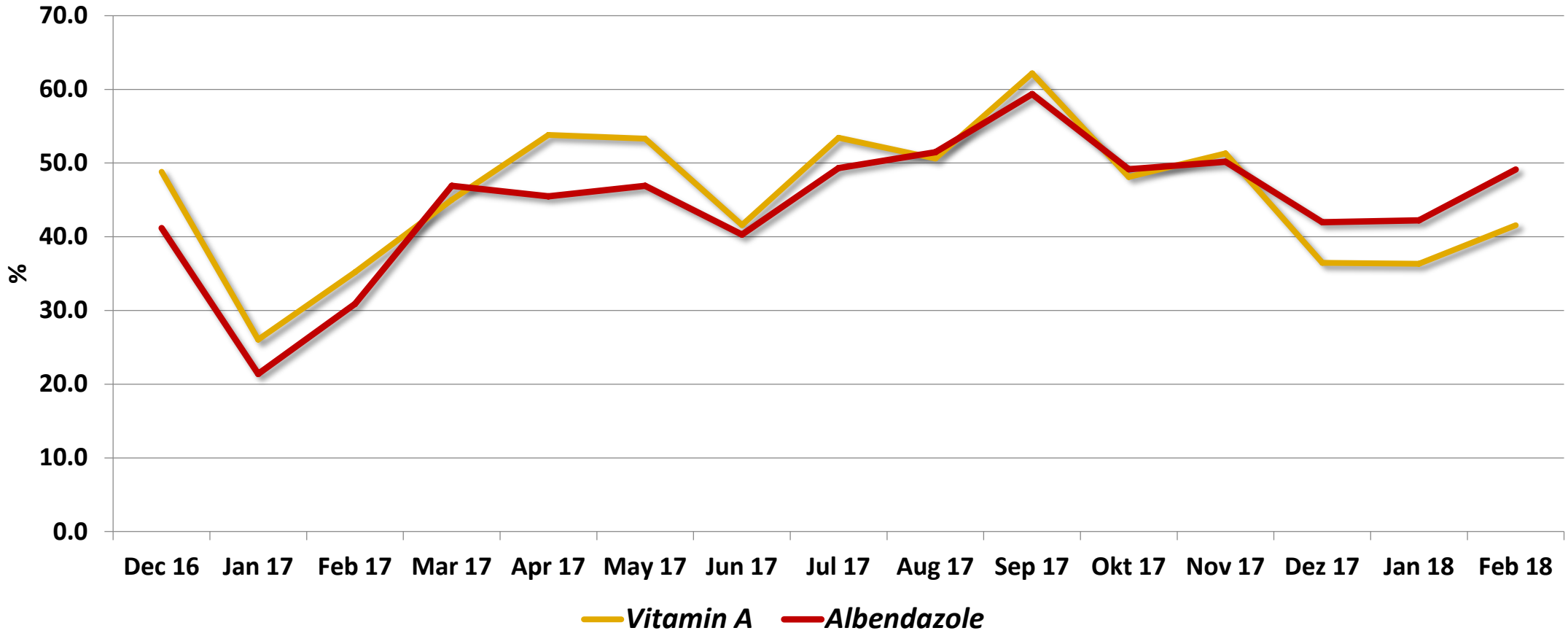


Diseases and health services trend data are available real time and guide decision making

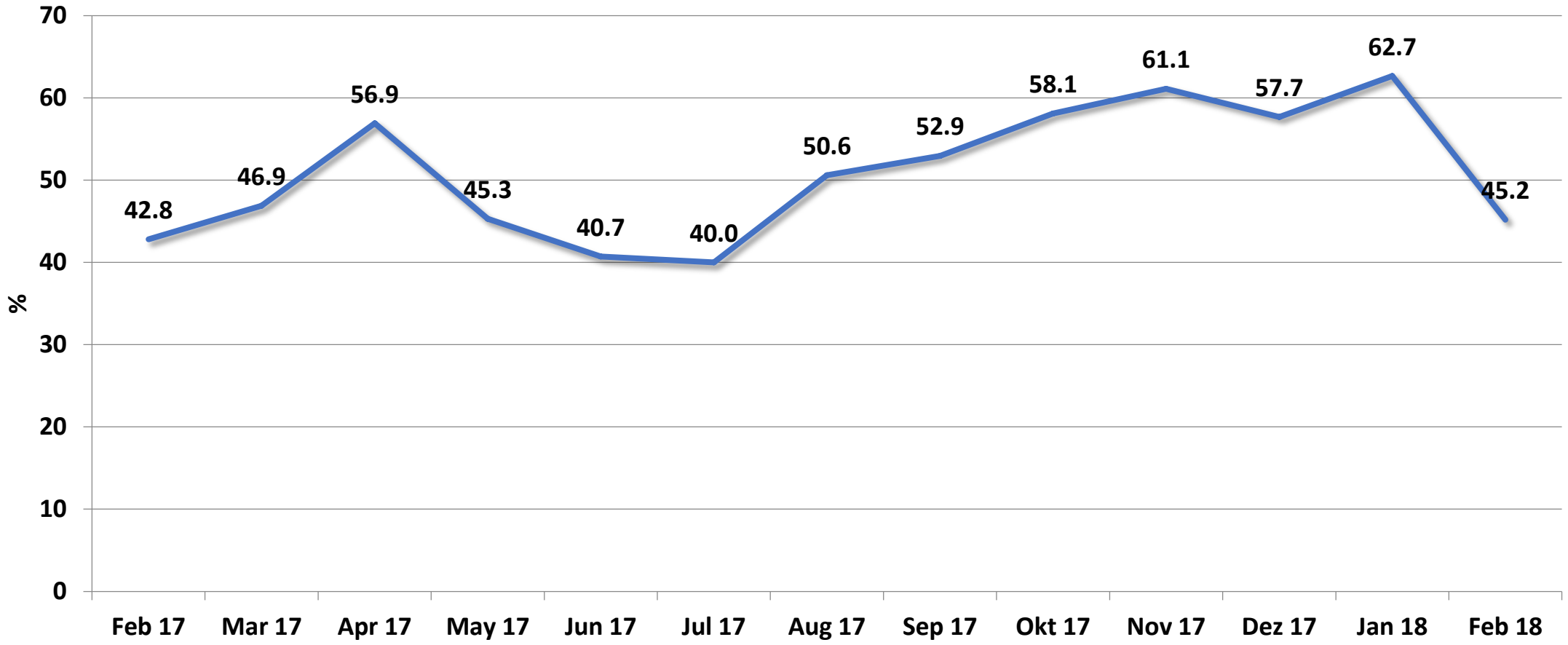
- Solutions
  - ✓ ALMANACH-Epidemiolgical trend of Malnutrition



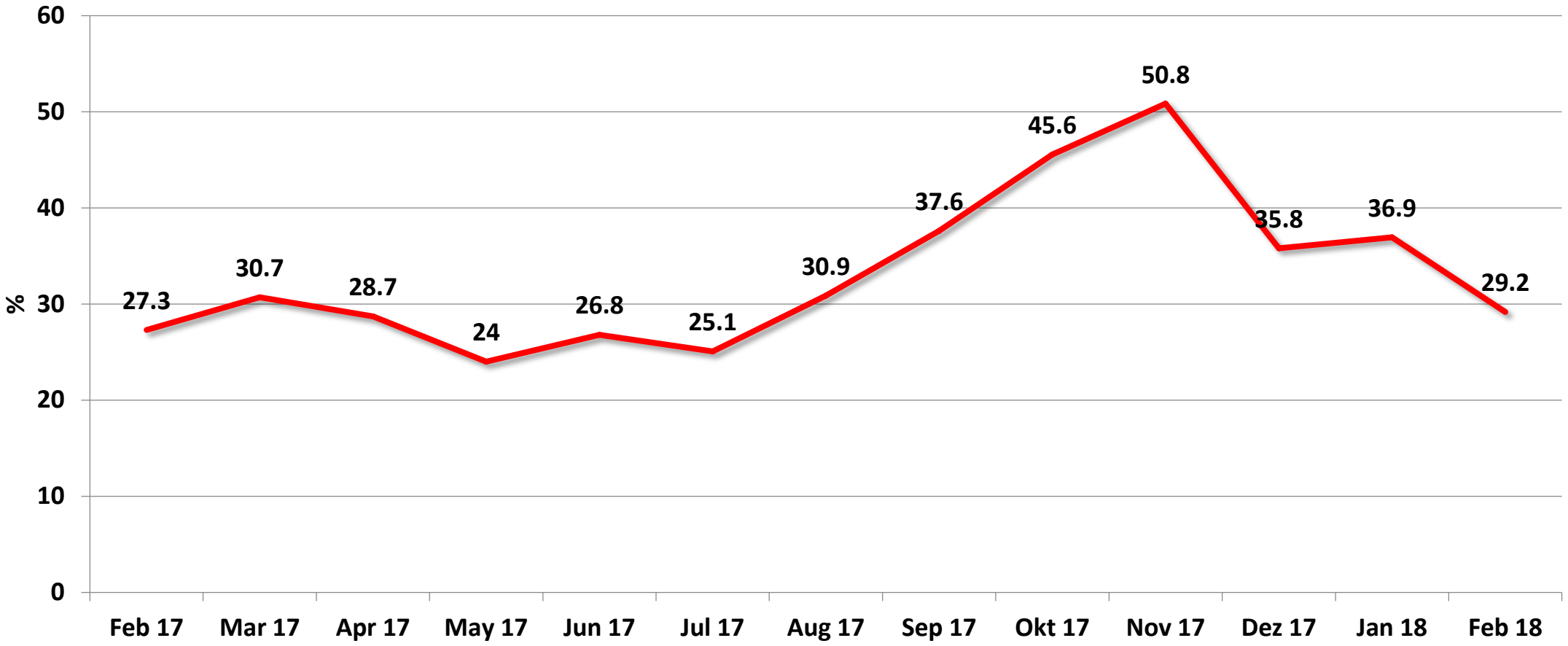
- Solutions
  - ✓ ALMANACH-Percentage of children receiving Vitamin A and Albendazole during the consultations



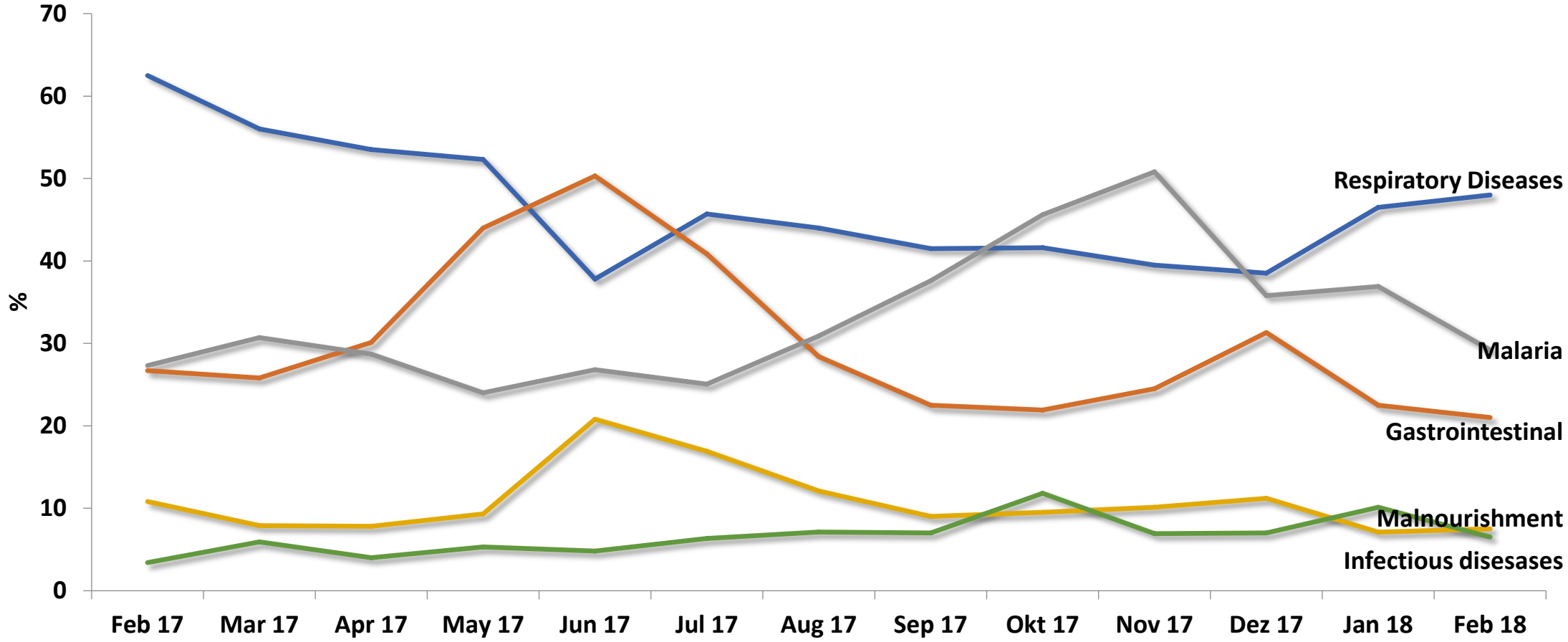
- # Solutions
  - ✓ ALMANACH-Fever trend since implementation



- Solutions
  - ✓ ALMANACH-Percentage of children who tested positive for malaria since implementation



- Solutions
  - ✓ ALMANACH-Trends of the main group of diseases from February 2017 to February 2018



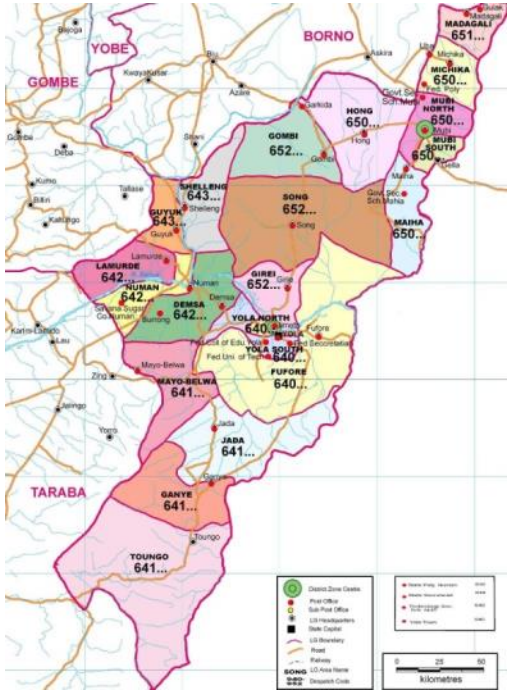
- # Solutions
  - ✓ ALMANACH-Scale up

Current (ICRC) Project

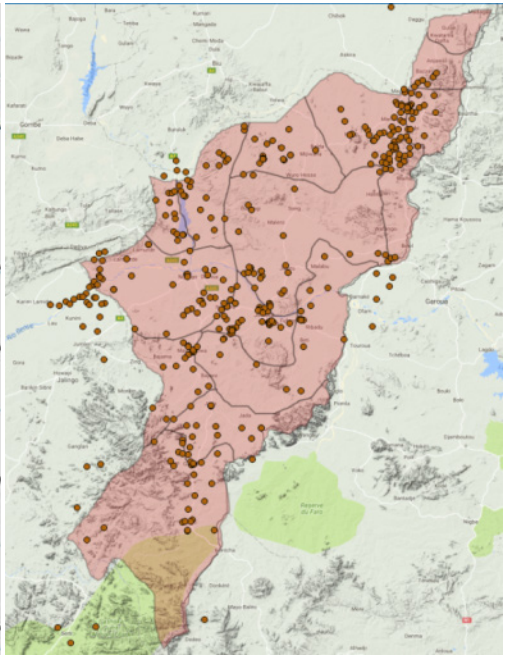
- Innovation implementation
- ‘Clinical Trial’ (incl. Baseline)
- 12 PHCCs (+)
- Proof of concept
- Scaling up
- DPIA

ADSPHCDA scale up

- Replication
- Integration
- 400 PHCCs (?)
- Improvements: clearly described and monitored
- Budgets to be secured
- Sustainability measures!



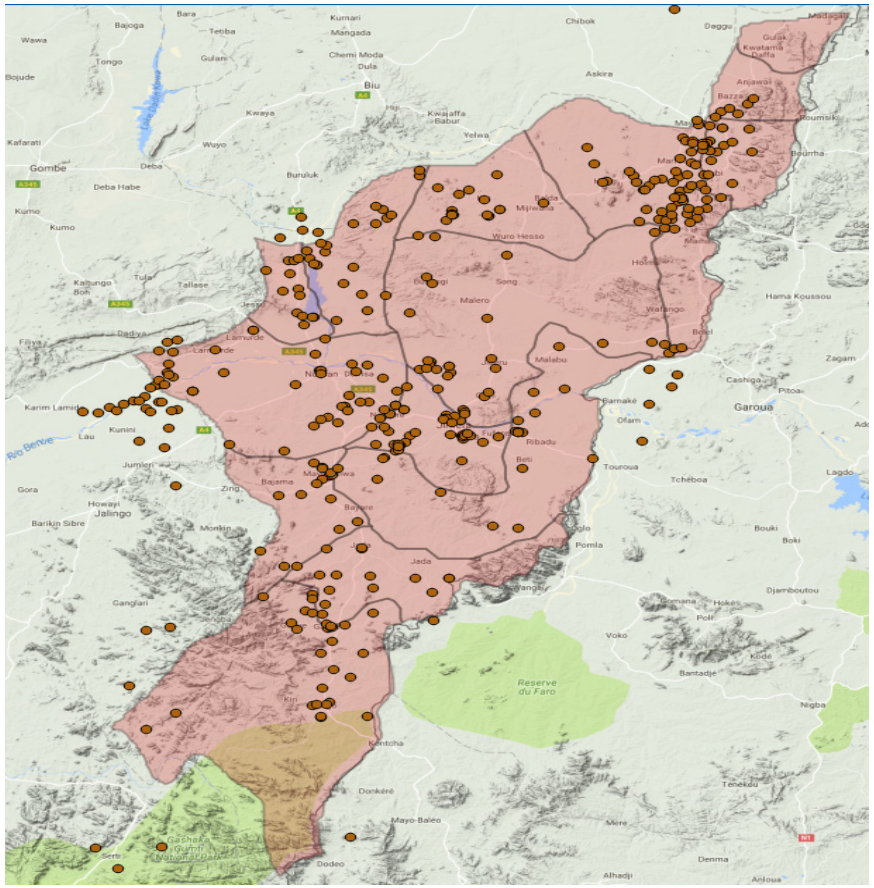
- # Solutions
  - ✓ ALMANACH-Health Facility Survey (Oct 2017) for a potential scaling up in ADAMAWA state



- # Solutions
  - ✓ ALMANACH-Health Facility Survey Objectives

1. To **assess** if PHCCs have **minimum requirements** in terms of equipment, drug supply, human resources and infrastructure to implement ALMANACH.
2. To **estimate the resources and the needs** present at PHC level in Adamawa to better adjust the foreseen implementation of ALMANACH to the reality of the setting.
3. To provide ASPHCDA with strategic information to strengthening the health service provided.
4. Findings of this survey will be used to address the main stakeholders involved in the scaling up of ALMANACH to advocate for the fulfilling of the minimum requirements for a proper implementation of the project at state level.

- # Solutions
  - ✓ ALMANACH-Health Facility Survey Methodology

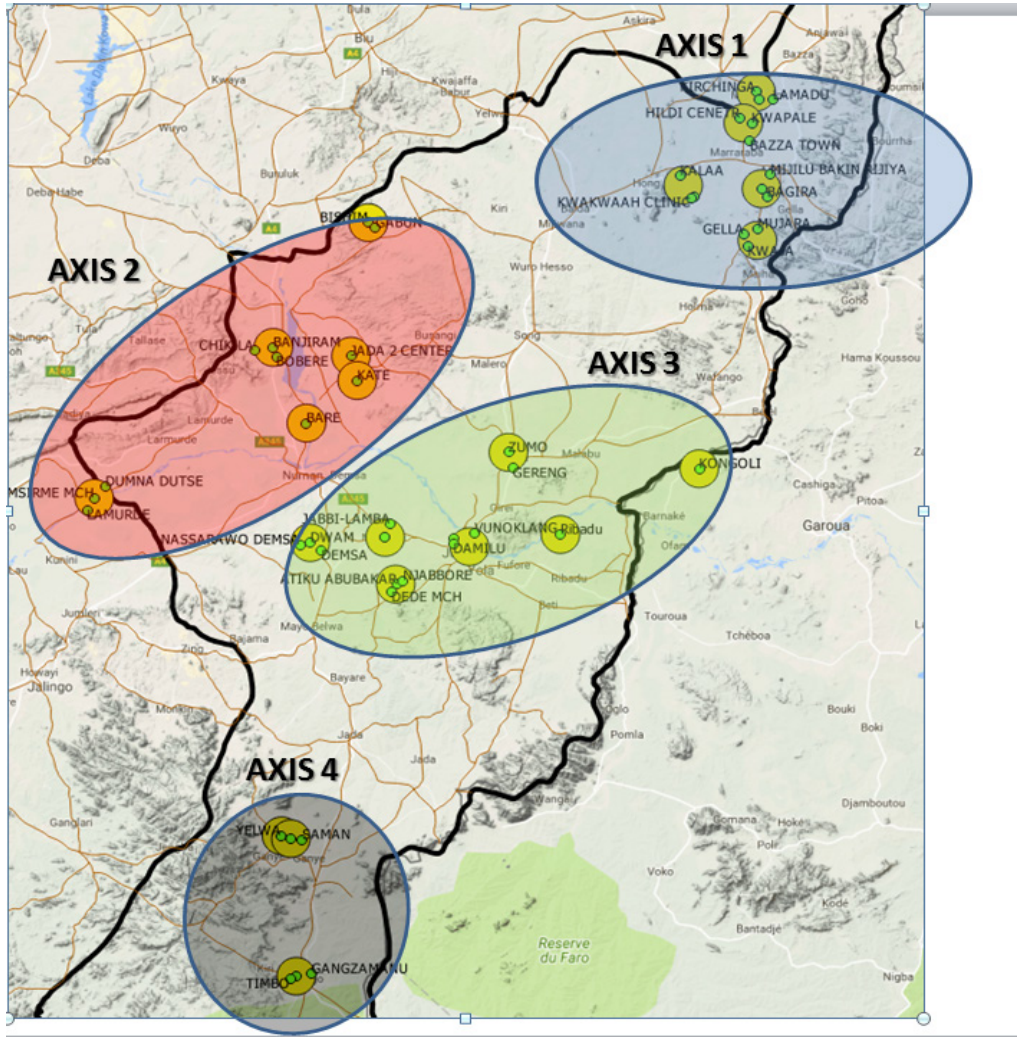


<u>Sampling and facility selection</u>

- Total of 403 PHCCs ; geo-oordinates of each PHCCs available
- Sampling: From each LGA one health facility has been randomly selected for a total of 21 health facilities.
- A 10-kilometers area (buffer) created around each of the 21 randomly selected PHCCs.
- From all the health facilities (81) included in these buffers 3 randomly selected for a total of 48 PHCCs to be surveyed .

- # Solutions

✓ ALMANACH-Organizing the Survey



Physical visit to 38 (48) health facilities

Interview over phone with the health workers in charge of 61 (84) health facilities.

-4 axes that can be covered by 2 teams -Each team is composed by 2 4WD cars
-By considering the possibility of accommodation in the area of investigation, each team should be able to cover an axis in 3-4 days..
-Team gamma will be in charge of conducting the phone survey under the coordination of the ASPHCDA and it will be built up by ASPHCDA and ICRC's staff

- # Solutions
  - ✓ ALMANACH-Results: Main conclusions

- ❑ Around 70% of the PHCCs have the requisite readiness to implement ALMANACH.

- ❑ About 15% are in need of improvements in terms of hygienic condition, drug supply and electricity before implementing ALMANACH.

- ❑ 15% : issues with low utilisation rate and lack of internet connection.

- # Conclusions
  - ✓ Enhanced Clinical Outcomes and Disease Trend Monitoring

✓Prioritize focus on Universal Health Coverage with basic PHC package

✓Validate coverage by using real-time monitoring tools

✓Improve Service Quality by enhancing adherence to agreed protocols

✓Replace current “Standing orders” with algorithms

✓Promote the use of electronic algorithms

✓Advocate for harmonization of eHealth tools and dashboards

✓ALMANACH Concept is ideal for developing countries

Thank you

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