BID INITIATIVE
Better data. Better decisions. Better health.

BLN Webinar: Challenges in Ascertaining Proof of Vaccination in Routine Childhood Immunization in Burkina Faso

Dr Lassane Kabore (PhD)

BID INITIATIVE
Better data. Better decisions. Better health.

Webinar housekeeping

- In the Chat box, type name and the country where you are connecting from – include number of other persons if sharing same connection
- All participants will be muted and videos disabled to allow the speaker to present without interruption.
- Q&A session will be held at the end of the presentation.
- Questions can also be submitted via the chat box. They will be logged and answered during the Q&A session.
- This webinar will be recorded. The link to the recording and presentation slides will be shared via the BID website.

BID INITIATIVE
Better data. Better decisions. Better health.

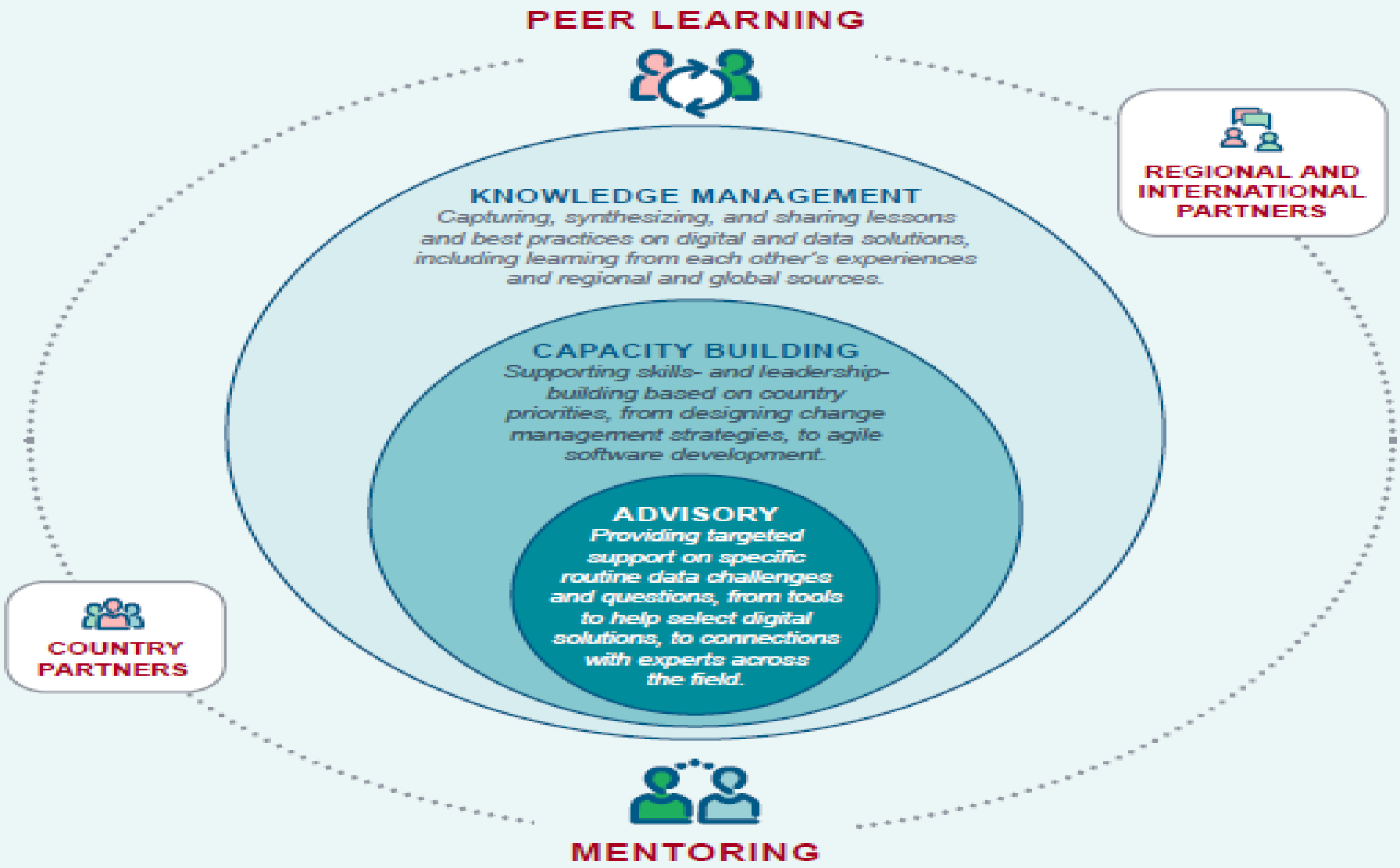
THE BID LEARNING NETWORK

14 May 2020

PATH

BID LEARNING NETWORK

The BID Learning Network (BLN) builds a bridge between countries, and regional and global partners, through mentorship, peer learning opportunities, and knowledge management. It provides targeted expertise to help governments strengthen their routine data systems.



Audience

This webinar should be of interest (but not limited) to:

- Policy Makers
- Health Care Workers
- Funders
- HMIS Specialist
- EPI Managers
- Data Management Specialists

BID INITIATIVE

Better data. Better decisions. Better health.

CHALLENGES IN ASCERTAINING PROOF OF VACCINATION IN ROUTINE CHILDHOOD IMMUNIZATION IN BURKINA FASO

14 May 2020

BID INITIATIVE
Better data. Better decisions. Better health.

Dr. Lassané Kaboré

- Currently Senior Program Officer with PATH's Centre for Vaccine Innovation and Access (CVIA), Zambia
- Held various positions in the Burkina Faso Ministry of Health at national and subnational levels
- Coordinator, Epidemiologist and Investigator – Agence de Médecine Préventive (AMP), Burkina Faso

Dr Lassané Kaboré (cont'd)

- Academic credentials:
  - PharmD from the University of Ouagadougou (Burkina Faso)
  - Joint MSc in International Health from Berlin (Germany) and Bordeaux (France) Universities
  - MSc in Public Health (Epidemiology) obtained as a Fulbright scholar at the University of Alabama at Birmingham (USA)
  - Currently finalizing a part-time PhD in Global Health at the University of Geneva, Switzerland.

CHALLENGES IN ASCERTAINING PROOF OF VACCINATION IN THE ROUTINE CHILDHOOD IMMUNIZATION IN BURKINA FASO

Better Immunization Data Learning Network (BLN)

Webinar

May 14, 2020

LASSANE KABORE, PHARMD, M.SC., MSPH, PH.D.(C)

CENTER FOR VACCINE INNOVATION AND ACCESS, PATH

Vaccine 38 (2020) 2808–2815

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Quality and reliability of vaccination documentation in the routine childhood immunization program in Burkina Faso: Results from a cross-sectional survey

Lassané Kaboré [a,b], Clément Z. Méda [c], François Sawadogo [a], Michèle M. Bengue [a], William MF. Kaboré [d], Alima T. Essoh [a], Alain Gervaix [e], Annick Galetto-Lacour [e], Isaïe Médah [d], Edouard Betsem [a,f,*]

[a] Agence de Médecine Préventive, Cité SONAR, Villa 7, Avenue Kwamé Nkrumah, 10PO Box 638, Ouagadougou, Burkina Faso
[b] Institute of Global Health, Faculty of Medicine, University of Geneva, 9 Chemin des Mines, 1202 Geneva, Switzerland
[c] University Nazi Boni, Bobo-Dioulasso, Burkina Faso
[d] Ministry of Health, Ouagadougou, Burkina Faso
[e] Department of Pediatrics, University Hospitals of Geneva, Geneva, Switzerland
[f] Faculty of Medicine and Biomedical Sciences, University of Yaounde 1, Yaounde, Cameroon

OUTLINE

- Background
- Methods
- Results
- Conclusions
- Lessons learned
- Recommendations
- Acknowledgments

BACKGROUND

Burkina Faso has recently introduced several new vaccines into the routine immunization program:

- Rotavirus and pneumococcal conjugate vaccines (PCV) in 2013;
- Measles-rubella second dose in 2015
- Serogroup A meningococcal conjugate vaccine in 2017
- Inactivated polio vaccine in 2018

BACKGROUND (CTD.)

- This expansion of the routine schedule constitutes an opportunity to update vaccination recording forms:

- Health facility-based records (FBRs), a.k.a. immunization register
- Home-based records (HBRs), a.k.a. vaccination cards

- Both can be valuable data sources in determining individual vaccination status for:

- Service delivery
- Program performance review (estimation of vaccine coverage)

BACKGROUND (CTD.)

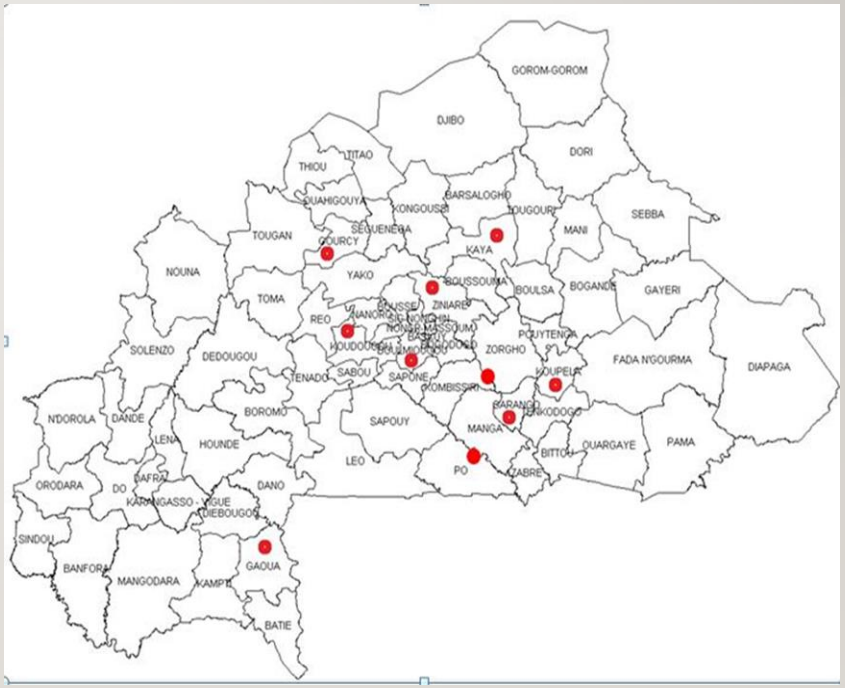
- HBRs are increasingly the focus of field research, including on their:
- Characteristics
- Availability
- Value in determining vaccination status
- Little is known about FBRs and HBRs in low-income settings with frequent new vaccine introduction
- For Burkina Faso, field observations had indicated an important diversity in circulating HBRs

BACKGROUND (CTD.)

- As new vaccines are introduced, FBRs and HBRs need to be updated timely, and countrywide
- Otherwise, capturing the exact vaccination picture of a given population could pose challenges
- Administrative coverage is prone to numerator or denominator biases
- This study assessed:
  - The characteristics of HBRs and FBRs,
  - Their completion by vaccination providers
  - Their usefulness in estimating vaccine coverage

METHODS

- **Setting**: Burkina Faso, 10 health districts selected from 70



METHODS (CTD.)

- Design

- 6-week (Dec. 2016-Feb 2017) questionnaire-based cross-sectional survey in 10 health districts that had suboptimal performance, and were being supported by an immunization strengthening program (GHSA)
- 3 Health facilities selected in each district (convenience sampling)
- 20 caregivers interviewed in each health facility
  - ✓ 15 caregivers of children aged 0-11 months
  - ✓ 5 caregivers of children aged 12-23 months

METHODS (CTD.)

- Data collection

Structured questionnaires were used to collect:

- Sociodemographic variables of the caregiver/child
- Characteristics of HBRs:
  - ✓number and names of vaccines displayed,
  - ✓dates of vaccines received from both the HBR and the FBR
- History of vaccination for PCV and rotavirus vaccines (considered easier to remember)
- Characteristics of health facilities, and of FBRs
- Sample pictures were taken to illustrate the main types of HBRs encountered

METHODS (CTD.)

- Data analyses

Operational definitions:

- **Standard HBR**: One that showed preprinted recording fields for all the 17 vaccine doses of the routine schedule at the time of the survey
- **Standard FBR**: the official and updated vaccination register supplied by the EPI directorate of the Ministry of Health
- **Fully immunized children**: those who received all recommended vaccines between their birth and the age of 12 months
- **Discordance** of vaccination information between HBR and FBR: Having different vaccination dates recorded for at least one vaccine dose, or vaccination information missing in one of the records; could vary between 0 and 17.

METHODS (CTD.)

- Data analyses

- Generated descriptive statistics (absolute and relative frequencies)
- Assessed relationships between discordance (used as data quality indicator) and potential predictors by logistic regression
- Calculated dose-specific coverage for each of the 17 doses of the EPI schedule and the proportions of FICs using HBRs, FBRs, and a combination of both, respectively
- FICs also calculated considering history of vaccination (PCV and Rota) as acceptable source (sensitivity analyses)
- Assessed agreement between HBRs and FBRs, taking HBRs as "gold standard", and calculated sensitivity, specificity, predictive values and the Kappa statistic
- Used Stata 13 for all analyses and considered p-value < 0.05 as significant

METHODS (CTD.)

- Ethical considerations

- Deemed to be non-research activity
- Considered programmatic evaluation
- Approved by the Ministry of Health
- Conducted in close collaboration with the EPI
- Involved verbal consents of respondents before interviews
- Final database contains no identifying information

RESULTS

Sociodemographics

- 619 children recruited:
- *458 (74.0%) aged 0-11 months*
- *302 (48.8%) females*
- *352 (43.1%) from rural areas*
- The mother was the caregiver for 98% of the children
- 53.3% of caregivers had no formal education

RESULTS (CTD.)

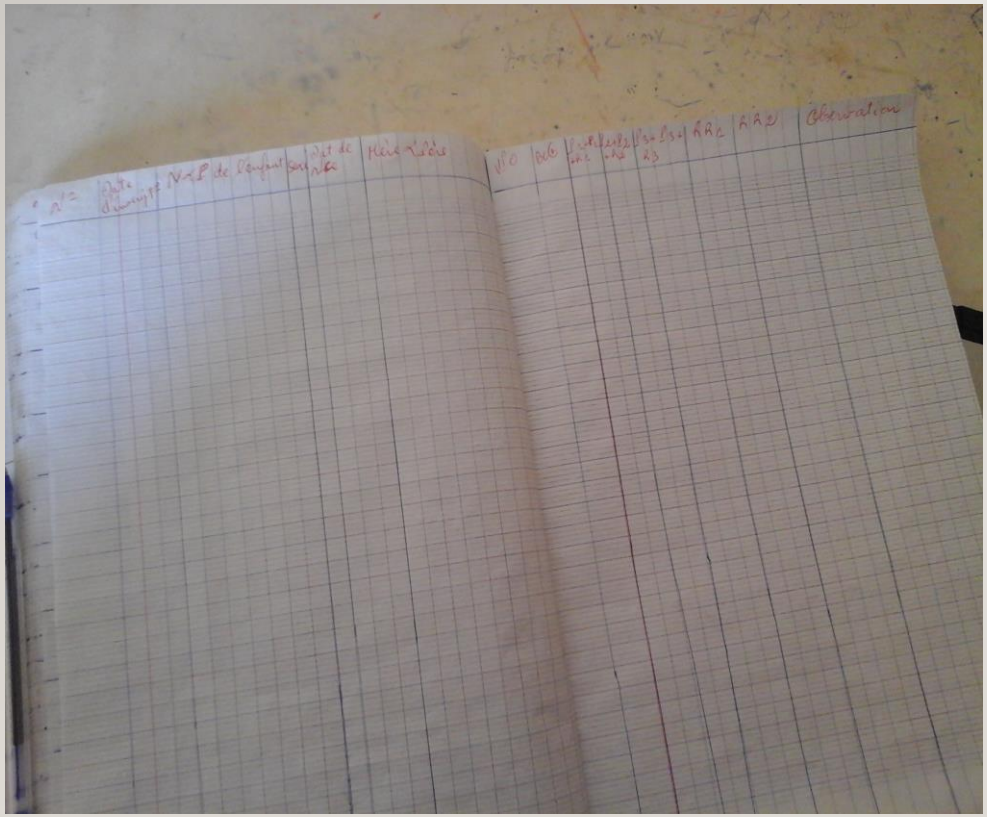
Characteristics of health facilities

- All 30 HFs were public
- Number of staff in charge of immunization activities ranged from 1 to 10 (**median of 3**)
- **All** HFs had registers (FBRs) to record vaccination data

- *Two thirds (20/30) of these FBRs were standard*
- *The other third consisted of a variety of adaptations from the standard version, including 3 notebooks and 7 locally-made FBRs.*

RESULTS (CTD.)

- Non-standard FBRs



RESULTS (CTD.)

Fig. 1. Samples of the main types of HBRs, Burkina Faso, 2017

a. Standard home-based record displaying all the 17 required items

b. School note-book sheet used as home-based record

c. Home-based record not displaying recently introduced vaccines (PCV, rota, MR2)

d. Curative consultation card used as vaccination home-based record

RESULTS (CTD.)

- **Standard HBRs**
- Of 615 HBR assessed, 311 (**50.6%**) were considered standard.
- % varied between 12.1% in Pô and 80.7% in Kaya

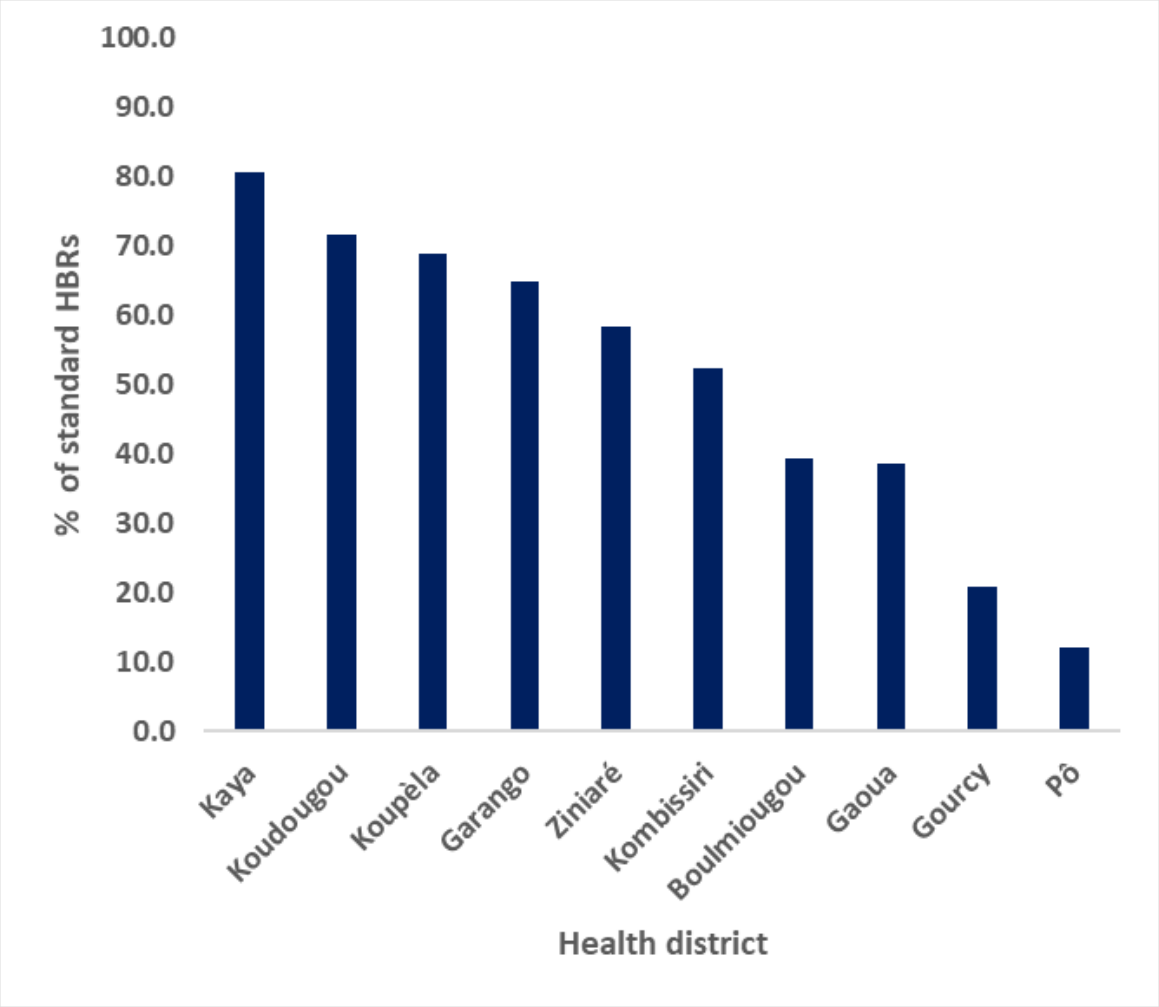


Fig.2. Proportions of standard HBRs by health district

RESULTS (CTD.)

Which antigens are missing from HBRs?

The % of HBRs that did not have dose-specific data recording field varied between 2.1% for BCG and 47.6% for MR2

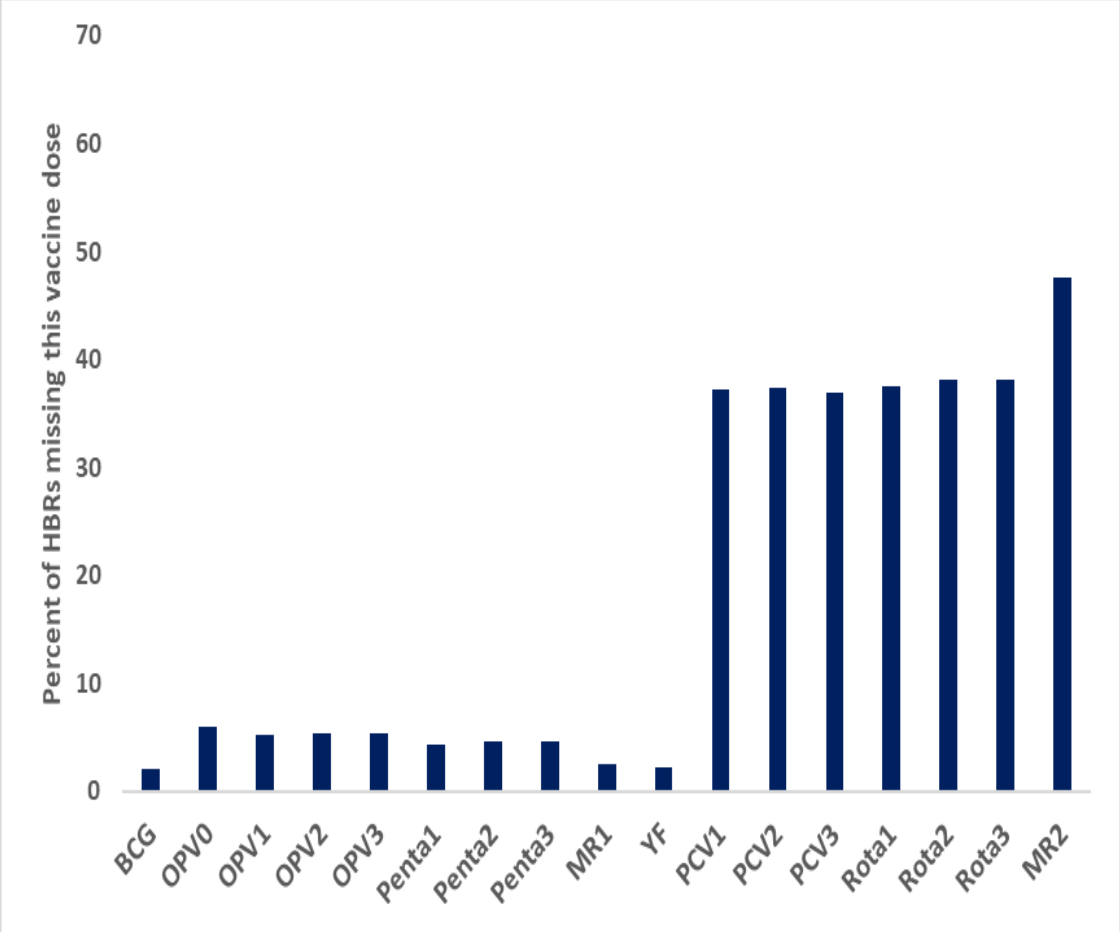


Fig. 3. Proportions of HBRs that did not have recording fields for the different antigens

RESULTS (CTD.)

- **Completion of HBRs after vaccination**

- Most children who were vaccinated according to the FBR, but had no mention of such vaccination in their HBR, had HBRs that missed recording fields for the same vaccines

=> ***Under-reporting occurs primarily when the HBR is outdated***

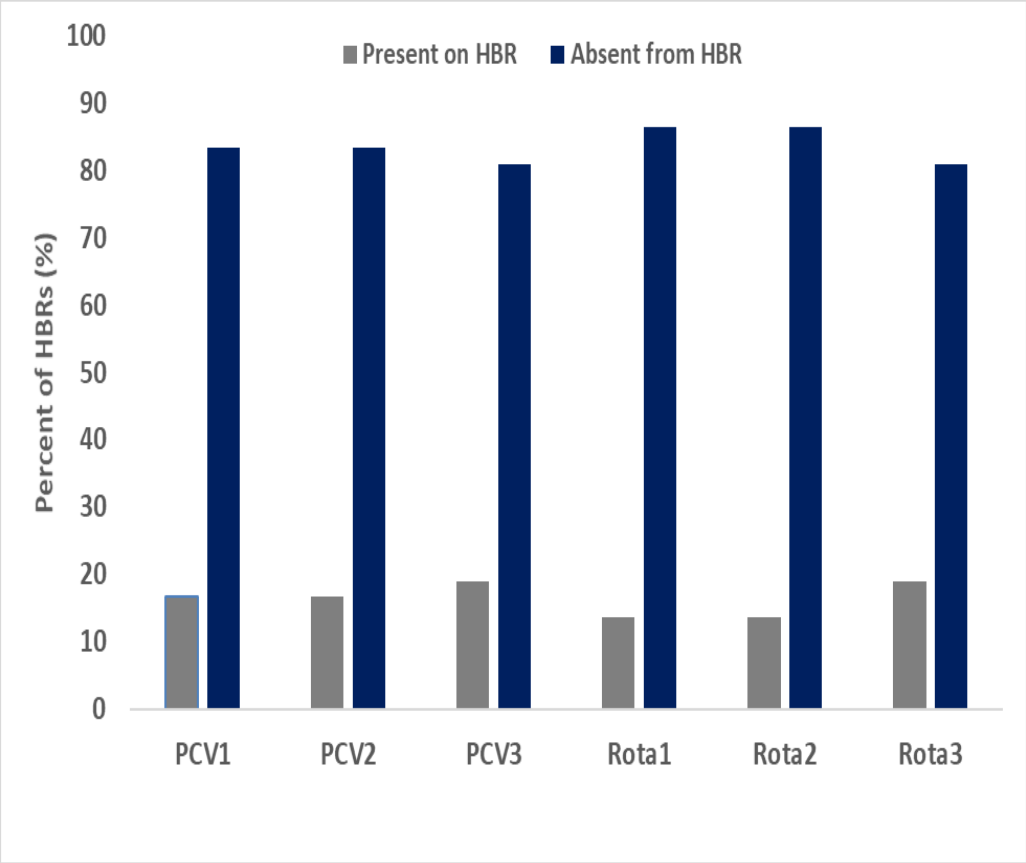


Fig.4. % of HBRs with data recording fields for selected vaccine doses among children vaccinated according to the FBR but unvaccinated according to their HBR, Burkina Faso, 2017

RESULTS (CTD.)

AGREEMENT FBRS-HBRS

- Median Kappa: 0.48 (IQR: 0.26-0.66) => **moderate agreement**

- FBRs had generally a **low negative predictive value**

Table 1. Agreement between FBRs and HBRs

Vaccine	Concordance	Kappa	Sensitivity	Specifity	PPV	NPV
BCG	0.92	0.26	0.92	1	1	0.16
OPV0	0.92	0.51	0.92	0.91	0.99	0.39
OPV1	0.86	0.15	0.86	0.67	0.99	0.11
OPV2	0.84	0.21	0.84	0.75	0.99	0.16
OPV3	0.82	0.35	0.82	0.85	0.98	0.28
Penta1	0.88	0.005	0.89	0.14	0.99	0.01
Penta2	0.86	0.12	0.87	0.58	0.99	0.09
Penta3	0.86	0.36	0.86	0.85	0.99	0.28
Rota1	0.86	0.65	0.86	0.85	0.95	0.67
Rota2	0.85	0.66	0.85	0.86	0.94	0.70
Rota3	0.84	0.67	0.84	0.86	0.92	0.74
PCV1	0.86	0.65	0.86	0.84	0.94	0.67
PCV2	0.85	0.66	0.85	0.84	0.93	0.70
PCV3	0.85	0.68	0.84	0.86	0.92	0.75
MR1	0.83	0.48	0.83	0.87	0.98	0.41
MR2	0.72	0,40	0.67	0.92	0.97	0.41
YF	0.87	0,74	0.76	0.98	0.98	0.80

RESULTS (CTD.)

- Discordance FBR-HBR

64.6% of children had discordant vaccination information between the HBR and the FBR

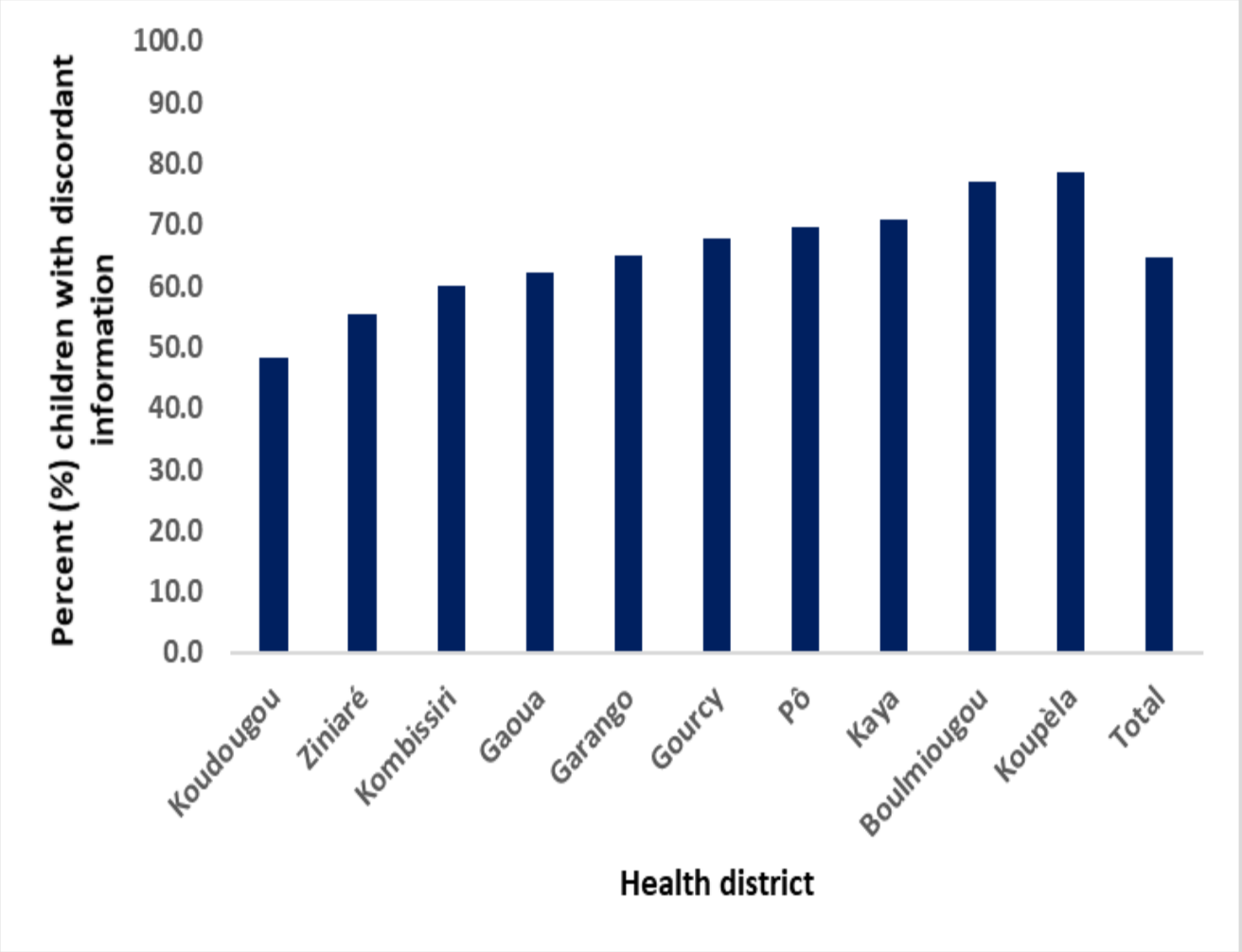


Fig.5. % of Proportions of children with discordant vaccination information for at least one vaccine dose, Burkina Faso, 2017.

RESULTS (CTD.)

- **Factors associated with discordance**

- Multivariable logistic regression model included: *age group, standard HBR, standard FBR, timely completion of the FBR*

- Being in the 12-23 months age group (OR= 3.05, 95% CI: 1.76-5.30, p=0.000) was a "**risk factor**"

- Possessing a standard HBR (OR= 0.46, 95% CI: 0.26-0.81, p=0.010) was "**protective**"

RESULTS (CTD.)

Antigen-specific coverage by source of information

- For all 17 vaccine doses, Coverage estimated with HBRs was greater than that with FBRs

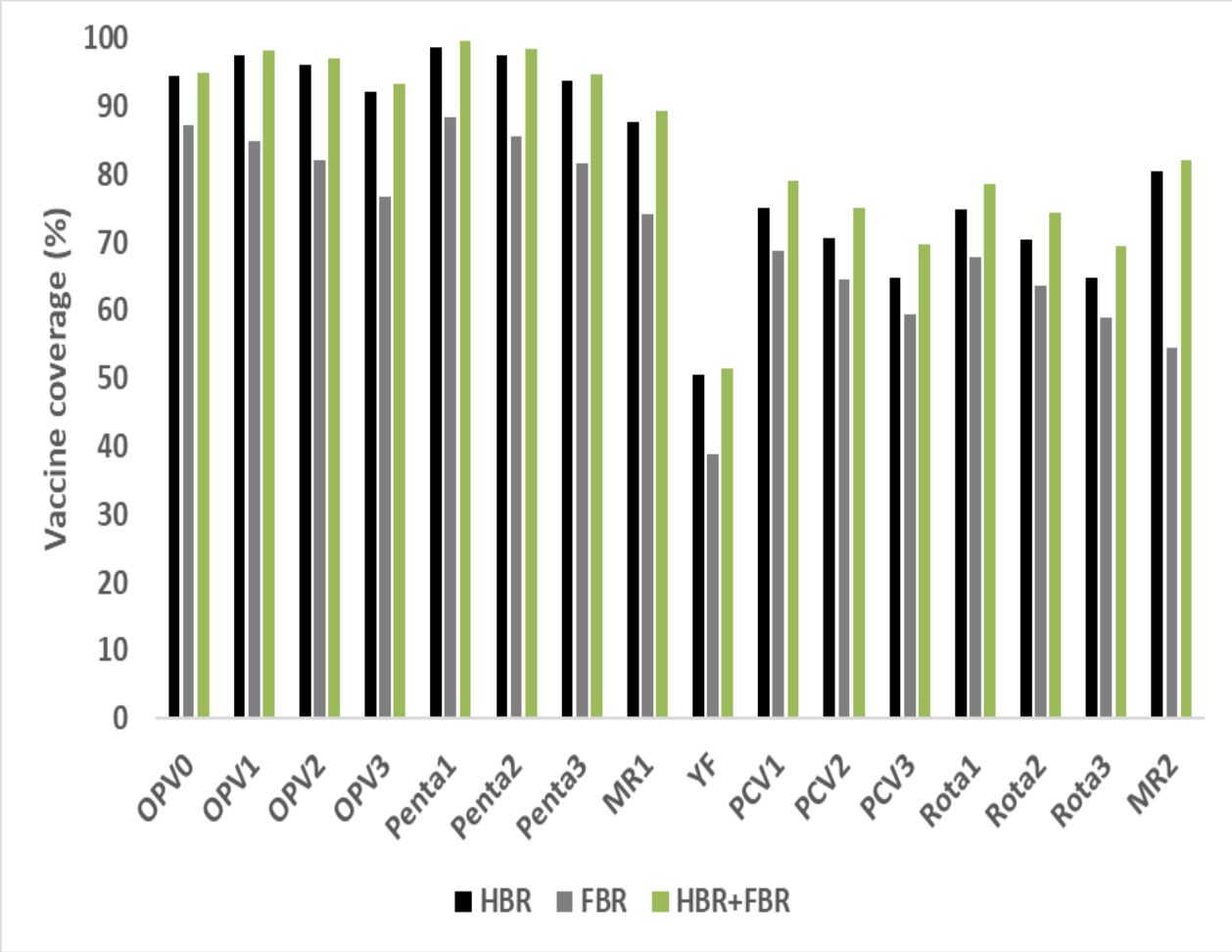


Fig.5. Dose-specific coverage by source of information, Burkina Faso, 2017

RESULTS (CTD.)

- Fully immunized children by source of information

- The % of FICs were **42.9%, 32.7%, 45.3% and 64.9%** for HBR, FBR, HBR combined with FBR, and HBR combined with FBR and recall, respectively.

- If YF vaccine was excluded, these proportions increased to **66.3.6%, 53.8%, 68.9% and 86.9%,** respectively.

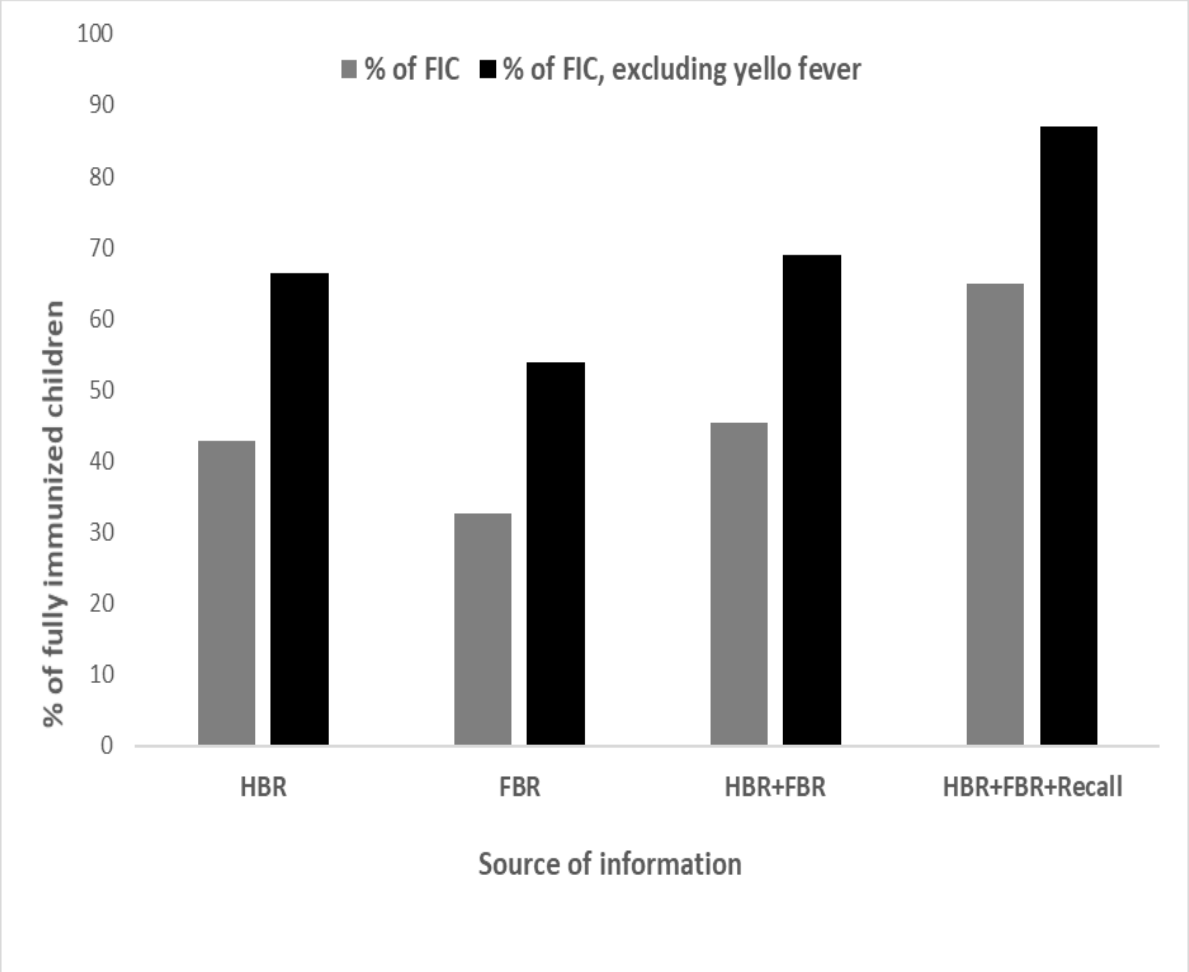


Fig.5. % of fully immunized children by source of information, with and without YF (global shortage)

RESULTS (CTD.): **SUMMARY**

- Half of HBRs and a 1/3 of FBRs were outdated and unfit to properly capture individual vaccination information
- Inconsistent completion of these forms by vaccinators:
  - *1 in 6 FBRs was not filled in with the latest vaccination information*
  - *Many vaccine doses were not recorded in HBRs following vaccine administration*
- Agreement between HBRs and FBRs varied across vaccine doses, with a median of 0.48 (**moderate agreement**)
- Nearly 2/3 of children were concerned with discordance of vaccination information between FBRs and HBRs
- Adding information obtained from caregivers' recall increased VC estimates

LESSONS LEARNED

- The quality of recording forms (FBRs and HBRs) will determine the quality of their filling by vaccinators–You cannot assume, ”they will manage”
- Triangulation between HBRs and FBRs may prove useful in the determination of vaccination status
- The precision of coverage estimates depends on the quality of primary recording, which itself depends on the quality of the recording forms
- The patterns of primary recording of vaccination information may be an overlooked area in immunization data quality improvement efforts

RECOMMENDATIONS

- **Short-term actions**

- Participatory planning involving all stakeholders
- Regular redesign and pretesting of HBRs and FBRs as the routine schedule evolves;
- Ensuring continuous supply of HBRs and FBRs;
- Training and/or supportive supervision of health workers;
- Implementation of job-aids;
- Field monitoring followed by use of data for timely decision-making

- **Longer term action**

- Implementation of an electronic immunization registry

RECOMMENDATIONS (CTD.)

- Beyond Burkina Faso, such actions are also relevant for other countries with similar contexts
- Future research should include systematic pictures taking and assess other quality elements beyond vaccination recording fields.

ACKNOWLEDGEMENTS

- The Global Health Security Agenda
- The Ministry of Health–Burkina Faso
- The Agence de Medecine Preventive
- Study support team
- Study participants

THANK YOU

QUESTIONS ?

BID INITIATIVE
Better data. Better decisions. Better health.

Thank you for connecting with us!

bidinitiative.org

facebook.com/bidinitiative

bidinitiative.org/blog

twitter.com/bidinitiative

bidinitiative@path.org

bidinitiative.org/bid-learning-network/participate/

Visit the website to subscribe to our newsletter.