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

Dr Lassane Kabore (PhD)
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- Q&A session will be held at the end of the presentation.

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- This webinar will be recorded. The link to the recording and presentation slides will be shared via the BID website.
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REGIONAL AND INTERNATIONAL PARTNERS

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Audience

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

- Policy Makers
- Health Care Workers
- Funders
- HMIS Specialist
- EPI Managers
- Data Management Specialists
CHALLENGES IN ASCERTAINING PROOF OF VACCINATION IN ROUTINE CHILDHOOD IMMUNIZATION IN BURKINA FASO
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- 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:
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  - 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

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CENTER FOR VACCINE INNOVATION AND ACCESS, PATH
Quality and reliability of vaccination documentation in the routine childhood immunization program in Burkina Faso: Results from a cross-sectional survey

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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
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

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Concordance</th>
<th>Kappa</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
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<td>YF</td>
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<td>0.98</td>
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</table>
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.
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QUESTIONS ?
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