AN OVERVIEW OF THE IMPORTANCE OF STANDARDISED PROTOCOLS AND INTERPRETATION OF MONITORING AND REPORTING METRICS OF VACCINE-PREVENTABLE DISEASES DURING OUTBREAKS

OUTBREAK MANAGEMENT OF DIPHTHERIA, MEASLES & RUBELLA

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DR KINGSLEY KATLEHO MOKOENA

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

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INTRODUCTION

- Vaccine-Preventable Diseases (VPDs) like measles, diphtheria, and rubella threaten public health in South Africa.
- Low immunisation coverage is a growing problem making outbreaks a common occurrence.
- During outbreaks, monitoring and reporting metrics focus on detecting, confirming, and classifying cases, identifying outbreaks, and assessing the impact of interventions.
- Recent outbreaks (e.g., measles in 2022/3, rubella 2024, diptheria 2024) highlight gaps in data consistency, reporting delays, and fragmented protocols.
- Standardisation of case definitions, thresholds, and data tools is critical for rapid containment.

OBJECTIVES

- Understand why standardised outbreak protocols are essential.
- Advocate and enhance adherence to national and WHO outbreak tools and protocols.
- Improve data interpretation using tools like DHIS2 and the Notifiable Medical Conditions (NMC) system.
- Strengthen outbreak metrics and case investigation processes.
- Review key metrics for measles, rubella, and diphtheria outbreak monitoring.
- Discuss challenges and opportunities in interpreting and reporting data.

WHY STANDARDISATION MATTER?

- **Consistency:** Enables consistent monitoring of progress and gaps. Ensures uniform case definitions (e.g., measles rash vs. rubella). Ensures comparability across regions.
- **Efficiency:** Rapid, coordinated, and evidence-informed response. Streamlined reporting via DHIS2 and NMC. Facilitates integration with surveillance and response systems.
- **Accountability:** Aligns with WHO guidelines for cross-border outbreaks.
- **Equity:** Enables targeted responses in high-risk provinces (e.g., Gauteng, WC, KZN).

CONSEQUENCES OF INCONSISTENCY

- **Delayed Responses:** Delays in outbreak detection and response. Misclassified cases prolong outbreaks.
- **Resource Misallocation:** Vaccines sent to wrong districts.
- **Public Distrust:** Conflicting messages erode confidence in immunisation programs. **Incompleteness:** Incomplete reporting to DHIS2 and NMC as the data is not fully captured (i.e. missing data from some facilities).
- **Data:** Poor use of data for decision-making (resource misallocation).

CASE DEFINITIONS & SURVEILLANCE THRESHOLDS

- WHO & National case definitions (measles, rubella, and diphtheria) – Check NICD Website*
  - **Measles:** Fever + rash + cough/coryza/conjunctivitis.
  - **Diphtheria:** Respiratory symptoms + pseudomembrane.
  - **Rubella:** Maculopapular rash + lymphadenopathy.
- Alert vs Epidemic thresholds
- Importance of uniform use across provinces/districts
- **Thresholds:** Immediate reporting if ≥2 per 100,000 for suspected measles cases in a district.
- **Thresholds:** The WHO elimination target for confirmed measles cases is <1 case per million population.

* https://www.nicd.ac.za/wp-content/uploads/2021/10/NMC_-case-definitions-FLIPCHART_01-Oct-2021_final.pdf

REPORTING SYSTEMS & TOOLS

- **DHIS2:** Centralized data aggregation for trends. Routine data.
- **NMC System:** Mandatory reporting of notifiable diseases. Immediate case-based notifications. Surveillance data for outbreak detection.
- **Case Investigation Forms:** Standardized fields for lab, vaccination history.
- **Surveillance and Vaccination Manual:** Updated protocols.
- Importance of reconciling data sources.
  - Triangulate coverage data (DHIS2) and surveillance data (NMC) to see the impact of the vaccination on preventing outbreaks.

CORE OUTBREAK METRICS

- Attack Rate: Cases per 100,000 population.
- Vaccination Coverage: 95% of target population immunized (MR1/2), 80% (DTP3).
- Case Fatality Rate (CFR): Critical for diphtheria monitoring.
- Measles: Attack rate, CFR, R0, vaccination status
- Rubella: % of reproductive-age females, vaccination status
- Diphtheria: CFR, contacts followed up, vaccination status
- Used for tracking transmission, immunity gaps, containment

MEASLES OUTBREAK (2022/3)

- **Cases:** Spread across 5 provinces.
- **Challenges:** low MCV coverage.
- **Lessons:**
  - Standardized case forms improved lab confirmation turnaround.
  - Protocol gaps (e.g. late line listing, lack of standardized line listing).
  - Lessons on data interpretation.

DIPHTHERIA RESURGENCE

- Recent resurgence.
  - 33 confirmed cases of respiratory diphtheria (1 January 2024 - 16 March 2025)
  - More than 78% of the cases have been in adults (≥ 18 years of age).
  - 9 deaths, case fatality ratio of 27% (9/33) since the beginning of 2024.
- Cases linked to DTP3 coverage gaps.
- Causes:
  - Declining Childhood Immunization Coverage
  - Gaps in Booster Vaccinations
  - Increased Population Movement and Migration
  - Weakened Public Health Infrastructure
  - Socioeconomic and Environmental Factors

INTERPRETATION PITFALLS

- **Confirmation Bias:** Over-reliance on clinical signs without lab testing.
- **Data Silos:** DHIS2 not linked to other systems.
  - Data fragmentation between DHIS2 and NMC.
- **Threshold Misuse:** Ignoring WHO's 5% measles discard rate guideline.
- Misinterpreting cumulative vs new cases.
- Vaccine status reporting issues.
- Overreliance on lab results.

USING NATIONAL/WHO PROTOCOLS

- WHO Outbreak Guidelines: Measles outbreak toolkit, rubella elimination thresholds.
- SA Protocols:
  - NMC
  - Surveillance Manual: Outbreak investigation steps
  - DHIS2 Analytics
  - Vaccinator and Cold Chain Manuals
- National SOPs (availability or gaps).
- Strengthen and activate outbreak response teams when the need arises.
- Checklist for early response (EPI File with all the necessary documents).

RECOMMENDATIONS

- Training: Health workers on DHIS2, case investigation forms, and NMC.
- Data Audits: Quarterly reviews of reporting completeness.
- Vaccination Catch-Up: Target underperforming districts on immunisation coverage.
- Cross-Sector Collaboration: Labs, clinics, and NGOs aligned on protocols.
- Staff orientation on protocols.
- Align DHIS2 and NMC.
- Include interpretation aids in templates.
- Conduct after-action reviews.

CONCLUSION

- Standardised protocols and data tools save lives.
- Invest in DHIS2 interoperability, rapid response teams, and community engagement.
- “Outbreak readiness is immunisation equity in action.”

References

- WHO VPD outbreak guidelines
- National SOPs
- DHIS2/NMC tools
- Contact points for outbreak response
- EPI/Surveillance Manual

Thank You