Insights for Impact

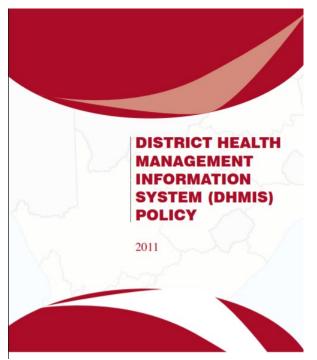A Data Quality story from South Africa
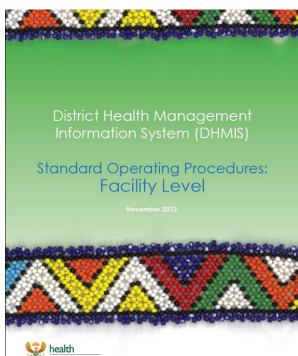
Why data quality started

- Multiple health authorities using multiple forms for collecting data
- Paper-based systems made analysis difficult
- Data was not used and therefore not noticed when missing

The Introduction of DHIS1

DISTRICT HEALTH MANAGEMENT INFORMATION SYSTEM (DHMIS) POLICY

2011

District Health Management Information System (DHMIS)

Standard Operating Procedures: Facility Level
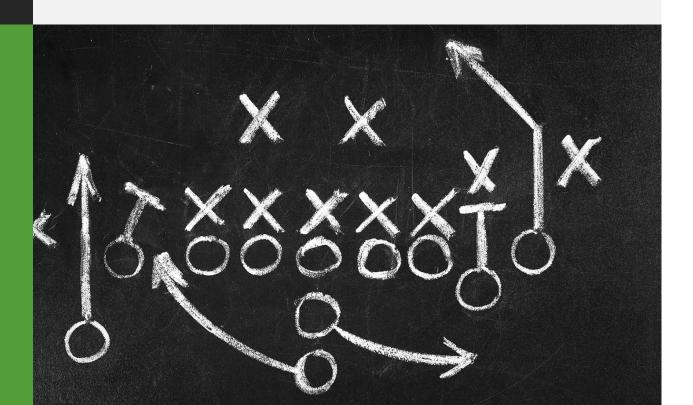
November 2012

health
Department:

- DHIS1 was Introduced and rolled out nationally between 1999-2000
- It was a computerized database but not web-based (MS Access and pivot tables)
  - Data regression and interpolation features
  - Validation rules – absolute and statistical
  - Customized data sets per facility type – allowed analysis of data element reporting rates
  - Data extracted to standardized pivot tables using a DataMart for data analysis and reporting
- To facilitate implementation
  - Minimum data set with standardized data collection tools
  - Development of HMIS policy and SOPs
  - Employment of Information staff in districts and provinces
- On introduction of new forms, DQ checks were done within 3-4 months to ensure that definitions were understood
- Extensive training on data quality and use of information
- Pre-submission data validation using a standardized template
- Data clean-up workshops before locking of data

Updating to DHIS2

- The introduction of DHIS2 was delayed because DHIS1.4 had great data quality features not available in DHIS2

- Shortcomings in DHIS1.4 compelled the move to DHIS2
  - Updating standalone computers at every capturing point with latest build
  - Length of time for data to reach the National Department of Health

DQ strategies

- Minimum data set

- Daily data capturing (DDC) at service point level

- Standardized public dashboards – 3 devoted to DQ

- Applying legends to indicators – unlikely values colour-coded blue

- HTML reports
  - Monitor timeliness and completeness prior to deadlines
  - Element reporting rate for community outreach services

- Pre-submission reports – also serve as feedback to lower level

- Monthly DQ report sent to National Department of Health

- Rapid Internal Performance Data Audits to compare source data with values in DHIS

Timeliness — Data sets assigned to the facility are completed by the 10th of the month

Completeness — Data sets assigned to the facility are completed by the 30th of the month

Programme completeness — The selected proxy data element for the programme is captured for facilities that are expected to report on it

Element reporting rate for community outreach

Missing and Outlier analysis – use the WHO app
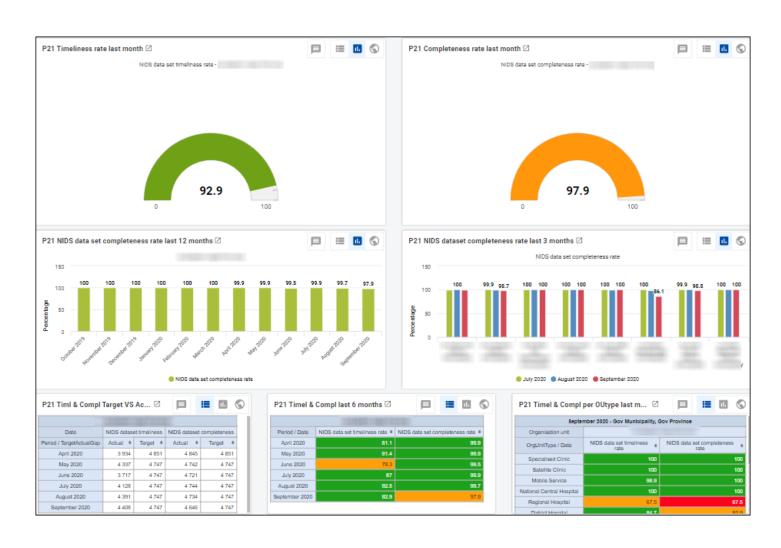
Validation rule violations

DQ measurements

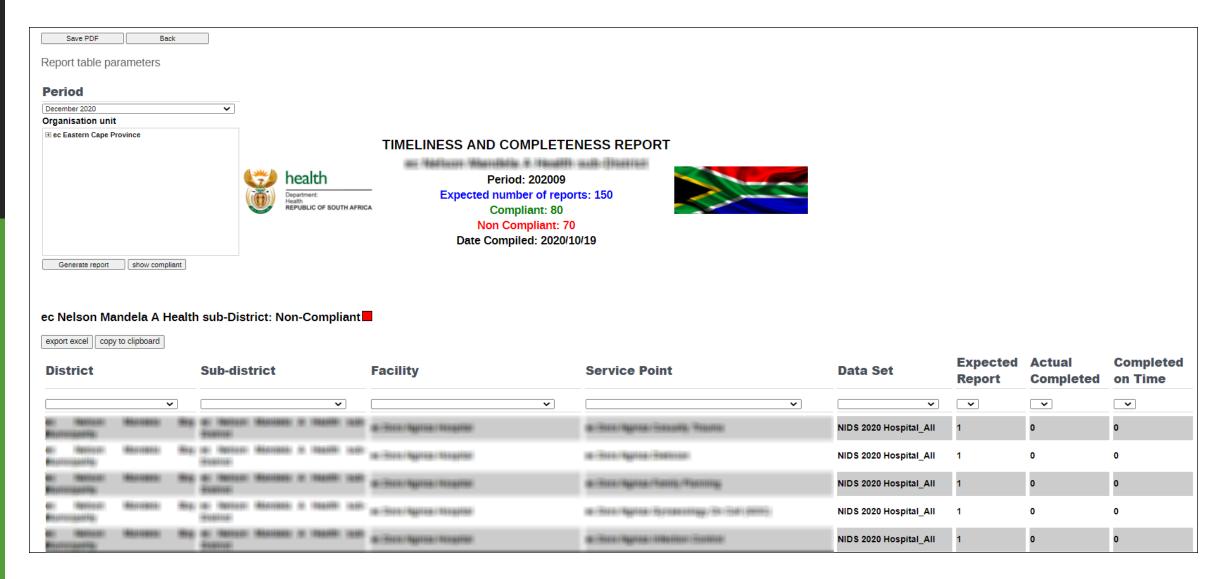# DQ dashboards

- Data quality
- DDC monitoring
- DQ monitoring

Used by managers at the lowest level of the hierarchy

Timeliness and Completeness

Timeliness and Completeness

Program Reporting

Clinic, Satellite Clinic, Mobile Service, Community Health Centre, EMS Station, EHS LG Service, EHS Port Health Service, EHS Prov Service												
Organisation unit	Data / Period	October 2019	November 2019	December 2019	January 2020	February 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	September 2020
	Antenatal programme reporting rate	100	100	100	100	99.9	99.8	99.9	99.9	99.9	99.9	99.6	99.9
	ART monthly programme reporting rate	100	99.9	100	100	99.9	99.6	99.9	99.7	99.6	99.6	99.3	99.6
	Adolescent programme reporting rate	100	100	100	100	100	100	100	100	100	100	100	100
	Child Health and Nutrition programme reporting rate	100	98.4	100	100	100	100	97.7	97.7	97.7	97.5	97.6	100
	Chronic Diseases programme reporting rate	100	99.9	100	100	100	100	100	100	100	99.8	99.8	100
	EHS programme reporting rate	100	100	100	100	97	100	100	100	85.7	100	94.4	85
	EMS programme reporting rate	100	100	100	100	100	100	100	100	100	100	100	100
	EPI programme reporting rate	100	100	100	99.9	99.9	99.8	100	99.7	99.9	99.9	99.8	99.9
	HIV programme reporting rate	100	100	100	99.9	100	100	100	100	100	99.9	99.8	99.8
	Maternity programme reporting rate	100	100	100	100	100	100	100	100	100	100	100	97.4
	Mental Health programme reporting rate	100	99.9	100	100	99.9	99.6	99.7	99.7	99.9	99.9	99.7	100
	PHC programme reporting rate	100	100	100	99.9	99.9	99.4	99.9	99.9	99.8	99.7	99.4	99.8
	STI programme reporting rate	100	100	100	100	99.9	99.6	99.5	99.6	99	99.5	99.6	99.5
	TB monthly programme reporting rate	100	100	100	100	99.9	99.6	99.8	99.7	99.5	99.9	99.7	99.7
	Women's Health programme reporting rate	100	100	100	99.9	99.9	99.8	100	99.8	99.9	99.8	99.7	99.8
	WBPHCOT programme reporting rate	100	100	100	99.7	100	99.3	99.8	99.8	99.7	100	99.8	99.3

Element Reporting Rate

Missing Outlier Analysis

4.1 HIV

Table 7: Missing data and outliers for TROA (ART client remain on ART end of month – total)

Province	District	Sub-district	Unit	Data	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20	May 20	Jun 20	Jul 20	Aug 20
				ART client remain on ART end of month - sum						4081.0	4281.0	4390.0	4491.0	4551.0	4613.0	4640.0
				ART client remain on ART end of month - sum	7657.0	7808.0	7829.0	7792.0	7826.0	3990.0	4015.0	4074.0	4015.0	4024.0	3999.0	3980.0
				ART client remain on ART end of month - sum	2816.0	2860.0	2991.0	2849.0	2919.0	2967.0	2980.0					
				ART client remain on ART end of month - sum	6640.0	6643.0	6609.0	6606.0	6590.0	6574.0	6532.0	5298.0	3880.0	3486.0	3324.0	3121.0
				ART client remain on ART end of month - sum	12644.0	12640.0	12641.0	12644.0	12638.0	12630.0	12671.0	12642.0	12640.0	12639.0	12636.0	
				ART client remain on ART end of month - sum	2380.0	2370.0	2358.0	2353.0	2343.0	535.0	528.0	517.0	506.0	491.0	496.0	477.0
				ART client remain on ART end of month - sum	2518.0	2578.0	2594.0	2597.0	2586.0	2593.0	2788.0	2915.0	2969.0			
				ART client remain on ART end of month - sum	3693.0	3780.0	3774.0	3778.0	3797.0	3813.0	3863.0	3858.0		3879.0	3849.0	
				ART client remain on ART end of month - sum	3318.0	3377.0	3388.0	3372.0	3389.0	3338.0	3514.0	3564.0	3606.0	7180.0	3638.0	
				ART client remain on ART end of month - sum	5624.0	5736.0	5834.0	5870.0	5905.0	5928.0	5021.0	6048.0	35.0	6025.0	6000.0	6001.0
				ART client remain on ART end of month - sum	1574.0	1637.0	1619.0	1623.0	1636.0	1635.0	1658.0	1599.0	0.0	0.0	0.0	0.0
				ART client remain on ART end of month - sum	1079.0	1055.0	1022.0	1038.0	1036.0	1020.0	1037.0					
				ART client remain on ART end of month - sum	5638.0	5663.0	5674.0	5691.0	5701.0	5714.0	5752.0	5781.0	5916.0	5822.0	666.0	5729.0
				ART client remain on ART end of month - sum	695.0	697.0	703.0	699.0	698.0	0.0						
				ART client remain on ART end of month - sum	1866.0	1858.0	1867.0	1863.0	1864.0	1847.0	1864.0	1668.0	712.0	710.0	751.0	810.0

Validation Rule Violations

3.1 Validation Rule Analysis

Purpose/Definition: Validation rules are setup according to the relationship between data elements. When they are violated, it means that the data is incorrect and follow up must be done to get the correct data and capture it. It is not acceptable to ignore these violations – they should be corrected before the data is sent to the next level. The validation rule analysis tests validation rules against the data registered in the system. Validation violations are reported when the condition defined in the validation rule expression is not met, which means when the condition is false.

Validation rules compare two data elements that should either be greater than; less than; or equal to the other: e.g. Antenatal HIV status at first visit VS Antenatal 1st visit (with the instruction that Antenatal HIV status at first visit must be less than or equal to antenatal 1st visit).

Some validation rules pair two or more data elements that relate to one another: e.g Babies weighed in relation to immunisations.

Location: This report can be found under the Reports app.

Procedure to run the report:

Step 1: Log onto webDHIS > Search apps, then find Data Quality App

Step 2: Click on the 'Validation Rule Analysis'.

Step 3: Select Start date and End date, Validation Rule Group, and Organisation unit (or click "+" sign to cascade down to lower level Organisation units).

Step 4: Click on Validate button to run.

All violations must be corrected.

NB: Save your downloaded report as an Annexure to your pre-submission reports to attach when sending your completed report. E.g. fs_Free _State_validation rules_date OR at district level fs_Mangaung_validation rules_date.

NB: The report is downloaded and saved as an annexure (fs_Free _State_validation rules_15 July 2020) **for evidence.**
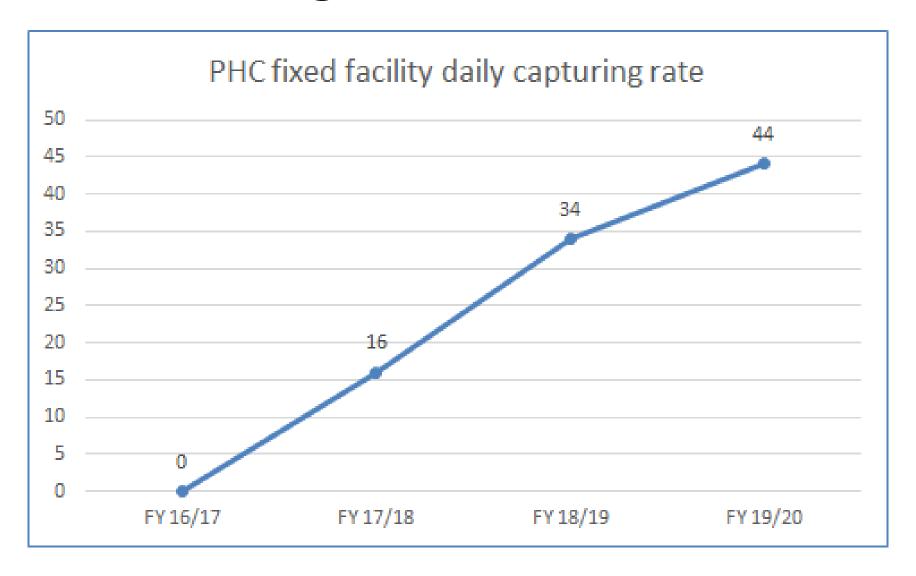
Training and guidelines

- Daily data capturing online course – learner manual

- Data quality module in DHIS2 Foundation course – learner manual

- Guidelines
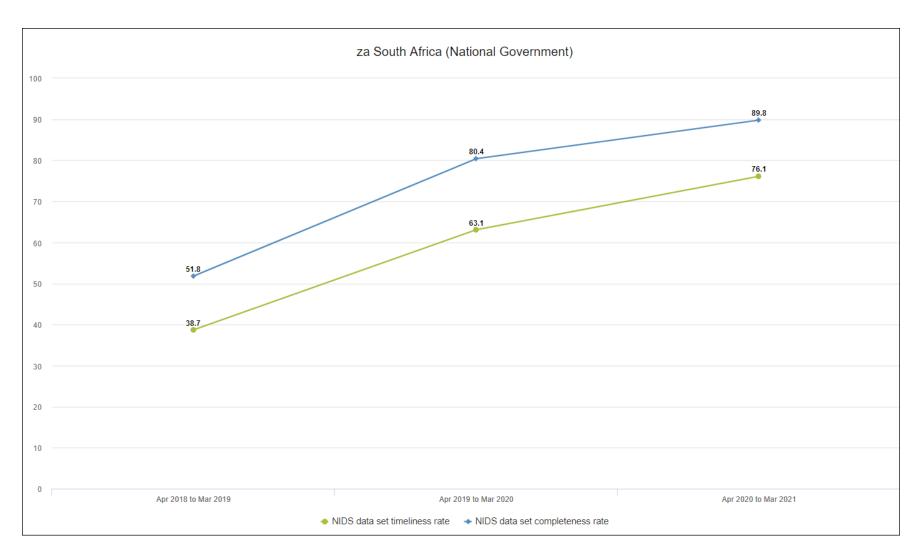 - Dashboard maintenance guidelines

Progress with DDC

PHC fixed facility daily capturing rate

Progress with Timeliness and Completeness

za South Africa (National Government)

51.8
80.4
89.8
38.7
63.1
76.1

- NIDS data set timeliness rate
- NIDS data set completeness rate

Apr 2018 to Mar 2019
Apr 2019 to Mar 2020
Apr 2020 to Mar 2021

Progress with Program Reporting

za South Africa (National Government)			
Data / Period	Apr 2017 to Mar 2018 ⬍	Apr 2018 to Mar 2019 ⬍	Apr 2019 to Mar 2020 ⬍
ART monthly programme reporting rate	99.4	99.6	99.7
Adolescent programme reporting rate	99.5	99.9	99.6
Antenatal programme reporting rate	99.4	99.8	99.8
Child Health and Nutrition programme reporting rate	97.6	98.8	99.3
Chronic Diseases programme reporting rate	99.3	99.3	99.6
EHS programme reporting rate	88.3	94.4	93.9
EMS programme reporting rate	99.1	99.2	98.4
EPI programme reporting rate	98.9	99.5	99.5
HIV programme reporting rate	98.4	97.8	99.3
Inpatient hospital programme reporting rate	95.9	96.8	97.8
Maternity programme reporting rate	98.1	98.6	99.2
Mental Health programme reporting rate	98.9	99.5	99.5
Outpatient hospital programme reporting rate	99.4	99.8	99.8
PHC programme reporting rate	99.3	99.5	99.6
STI programme reporting rate	98.8	99.3	99.5
TB monthly programme reporting rate	98.2	99.3	99.4
WBPHCOT programme reporting rate	92.2	96.9	98
Women's Health programme reporting rate	98.4	99.3	99.5

South Africa has made considerable progress with improving data quality since the introduction of DHIS. Monthly monitoring and reporting on data quality are essential to ensure progress.