



**9<sup>th</sup> SADC MET Proficiency Testing for potable water in Africa**

**EVALUATION WORKSHOP, Lilongwe, Malawi**

**2017.12.04**

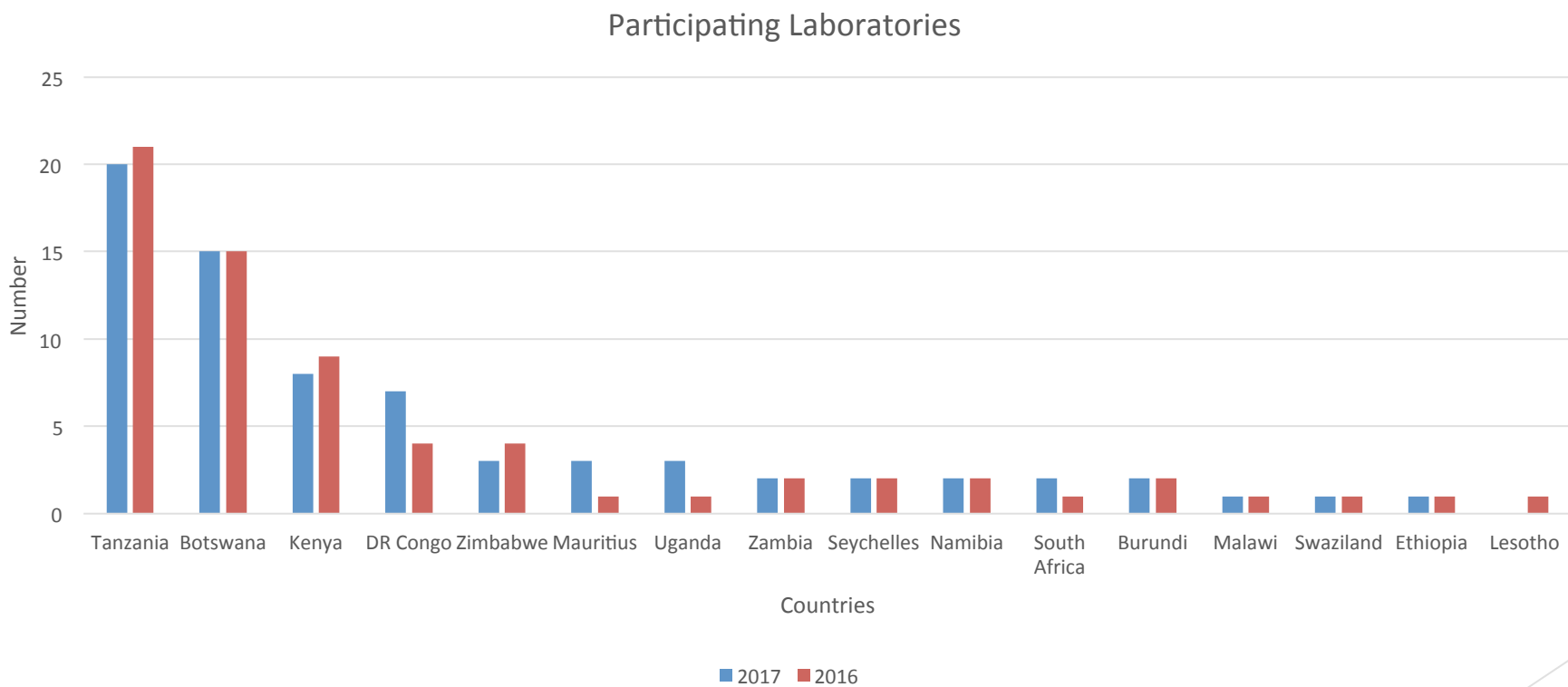
**Itseng Saudu**

**Botswana Bureau of Standards**

# Logistics

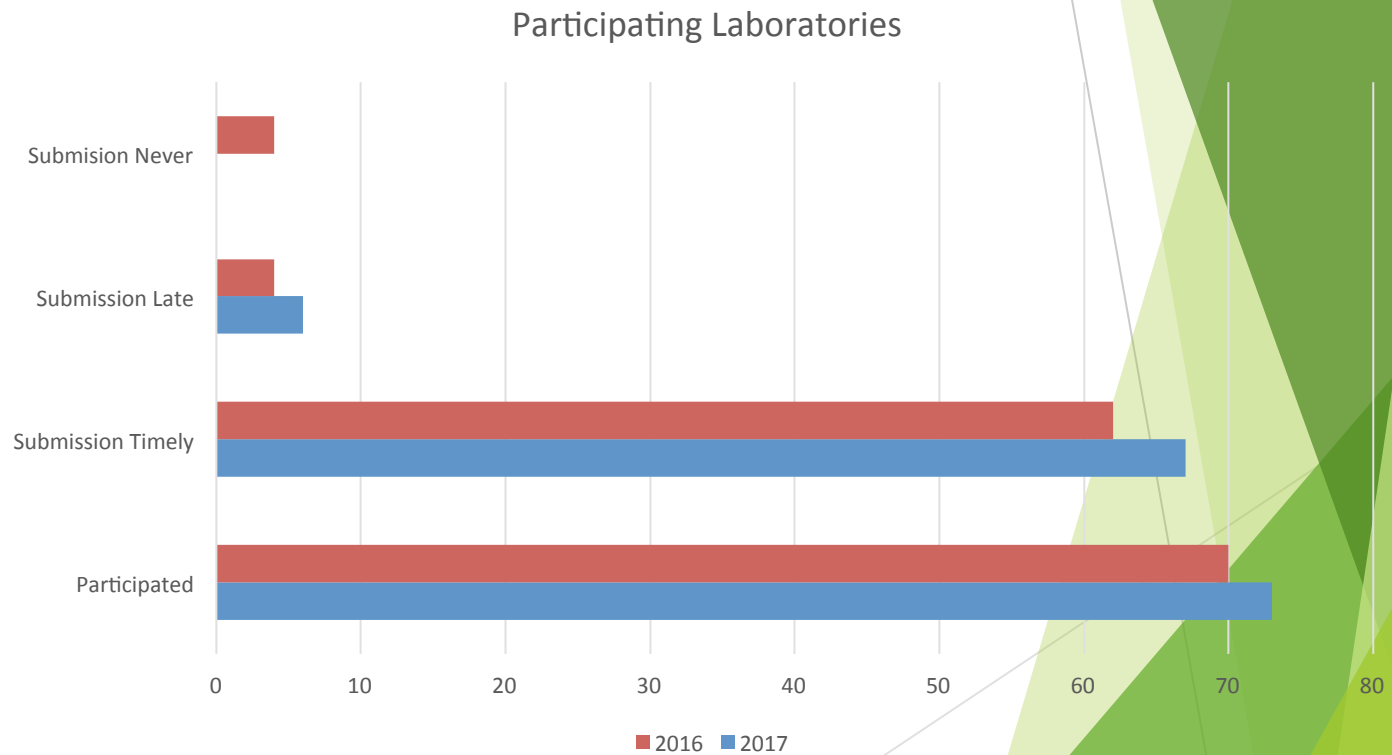
- Announcement of the 2017 PT Round by email - 03 February 2017
- Quality Control testing (Homogeneity) of the PT material 1-4 August 2017
- Shipping on 14 August 2017
- Shipping done by DHL, waybills communicated to some laboratories
- Delivery days differed most 2-4 days some 5 days
- Samples received in good condition
- Stability tests conducted 28-30 August 2017

# Number of Participating Labs



# Participating Laboratories continued

- ▶ Reasons for late submission varied
  - Lack of proper planning
- ▶ Communication challenges
- ▶ No non submission!!!



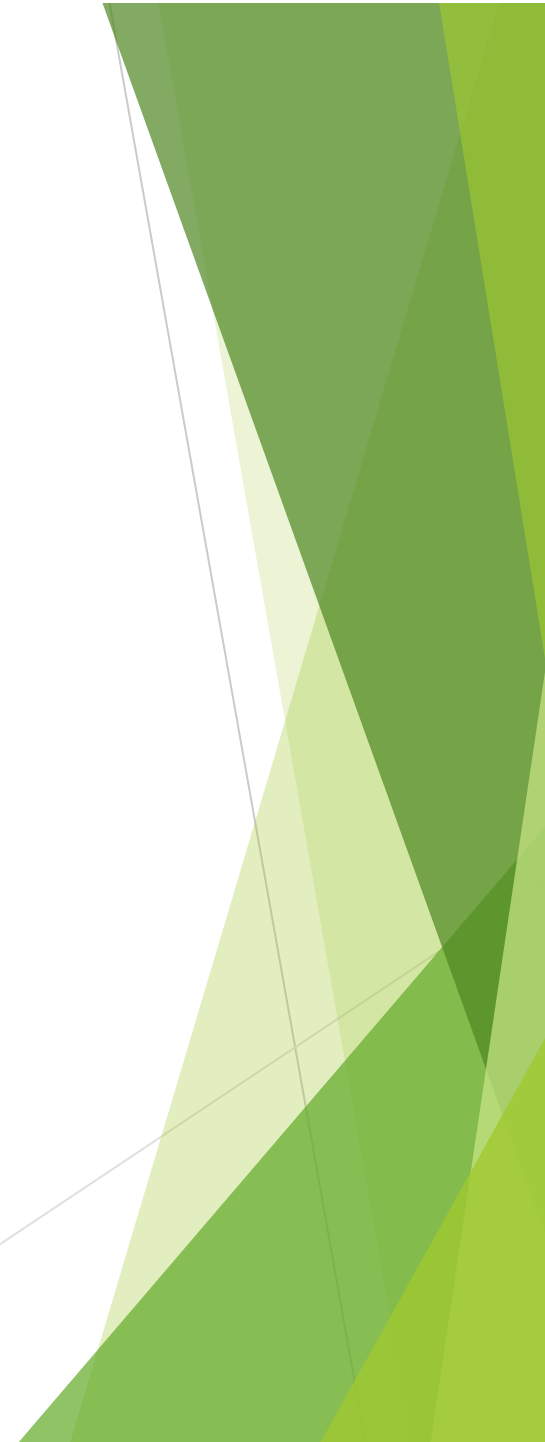
# Samples Used

- One sample dispatched
- Supplied by National Food Agency – Sweden
- PT samples from previous rounds- lyophilized/freeze-dried mixture of Microorganisms
- Determined microbial concentrations - samples tested for homogeneity and stability prior to and after dispatch by PT provider
- Manufacturer also tested samples for the same and later used samples in own PT scheme
- Volumes used 10ml all membrane filtration tests, 1ml for Total plate counts
- Tolerance intervals (upper and lower limits) are given as colony forming units per volume of analysis
- Tolerance within  $\pm 2 \sigma$  (**warning signal**) and  $\pm 3 \sigma$  (**action signal**)

# The evaluation process

## Data entry and evaluation/analysis

- Data sorted in ascending order
- Obvious outliers removed
- Square-root transformation of the data
- Statistical evaluation
- Standard deviation presentation using cfu
- Z-score calculation and performance evaluation



# Evaluation Criteria

Std. Deviation	Z- Score	Assessment
$-2\sigma$ to $+2\sigma$	$ Z\text{-score}  \leq 2.0$	<b>satisfactory</b>
$-3\sigma$ to $-2\sigma$ and $+2\sigma$ to $+3\sigma$	$2.0 <  Z\text{-score}  < 3.0$	<b>questionable (warning signal)</b>
$< 3\sigma$ and $> 3\sigma$	$ Z\text{-score}  \geq 3.0$	<b>unsatisfactory (action signal)</b>

# Results Summary

	Total Coliform bacteria	<i>E. coli</i>	Coliform bacteria @ 44°C	Enterococci	<i>P.aeruginosa</i>	TPC @ 37°C	TPC @ 22°C
Assigned value	29	17	13	38	16	18	17
Range (-3σ to +3σ)	9-62	5-35	4-27	11-79	2-40	6-39	5-35
Range (-2σ to +2σ)	14-50	8-28	6-22	18-64	6-31	9-31	8-28
Results received	72	70	51	46	41	59	45
Satisfactory	47	45	26	31	27	43	27
Questionable	8	5	6	1	3	8	12
Unsatisfactory	16	20	19	14	11	8	6
%,Satisfactory	65	64	51	67	66	72	60
%,Questionable	13	7	12	2	7	14	27
%,Unsatisfactory	22	29	37	30	27	14	13



# Results Summary Continued


	<b>Total Coliform bacteria</b>	<b><i>E. coli</i></b>	<b>Coliform bacteria @ 44°C</b>	<b><i>Enterococci</i></b>	<b><i>P. aeruginosa</i></b>	<b>TPC Count @ 37°C</b>	<b>TPC Count @ 22°C</b>
<b>No. of outliers (obvious)</b>	4	1	0	2	2	3	1
<b>No. of outliers (calculated)</b>	7	9	6	2	5	4	2
<b>False negatives</b>	3	6	8	6	4	0	1

# Methods used by laboratories

- ▶ Various methods used for each parameter
- ▶ More variation in Coliforms/E.coli methods
- ▶ No direct correlation between accuracy of results and method used
- ▶ Difficult to deduce the method used for some labs the way it is captured
  - ▶ Some labs stated their procedures ID e.g. SOP/WI ID



# Possible challenges with samples

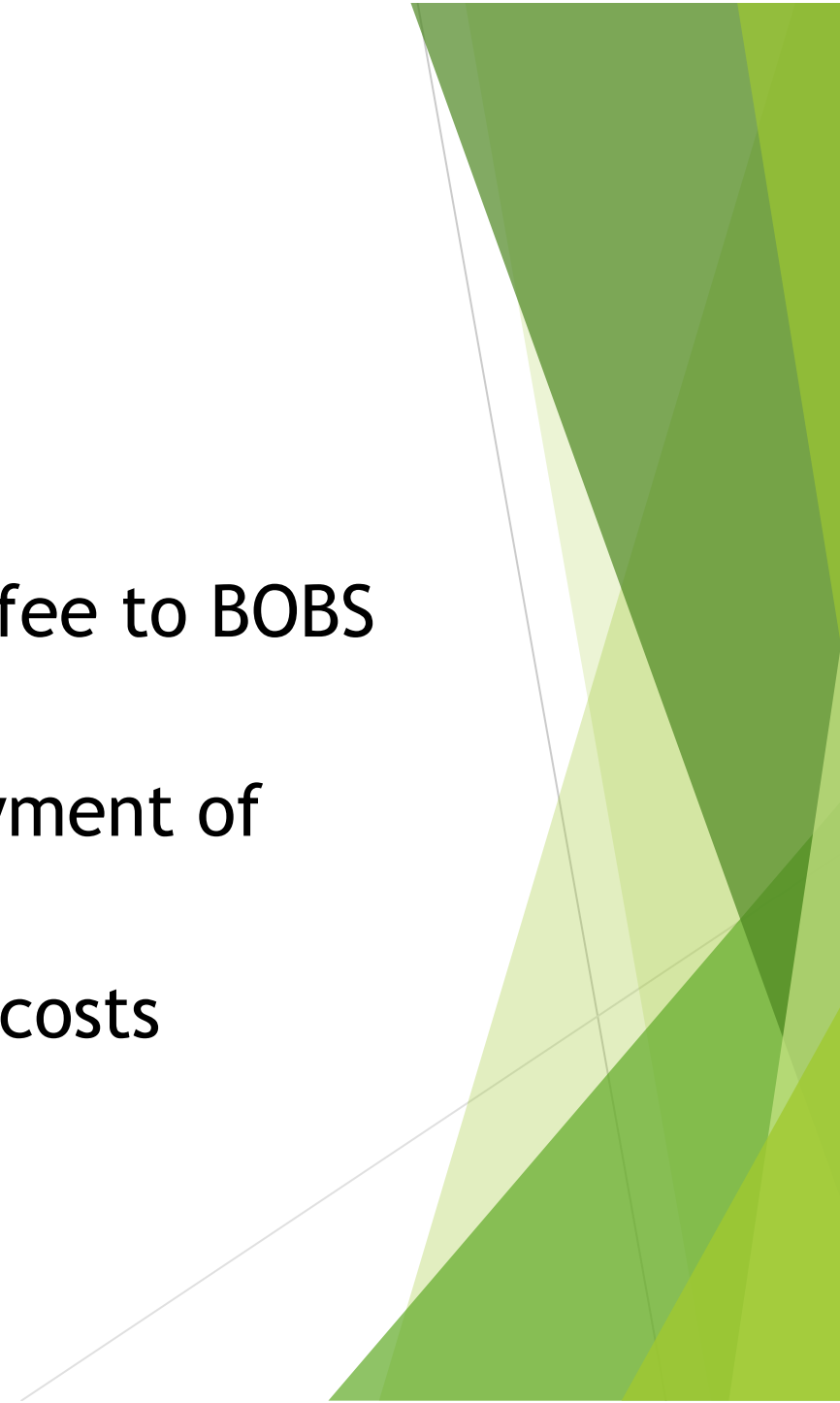
- ▶ Possible loss of sample during reconstitution
  - ▶ Lack of understanding of sample preparation instructions
  - ▶ Not following sample preparation instructions submitted with samples
  - ▶ Dilution errors
- 

# Challenges with the PT

- ▶ Delayed registration by some laboratories despite the announcement made well in time
- ▶ Delayed dispatch of samples to laboratories-procurement took long
- ▶ Failure to follow instructions for reporting e.g. some labs left out the dates for receipt and testing of samples
- ▶ Some labs left out most details in the reporting template they reported results only
- ▶ Late submission of results make increases time taken to prepare report

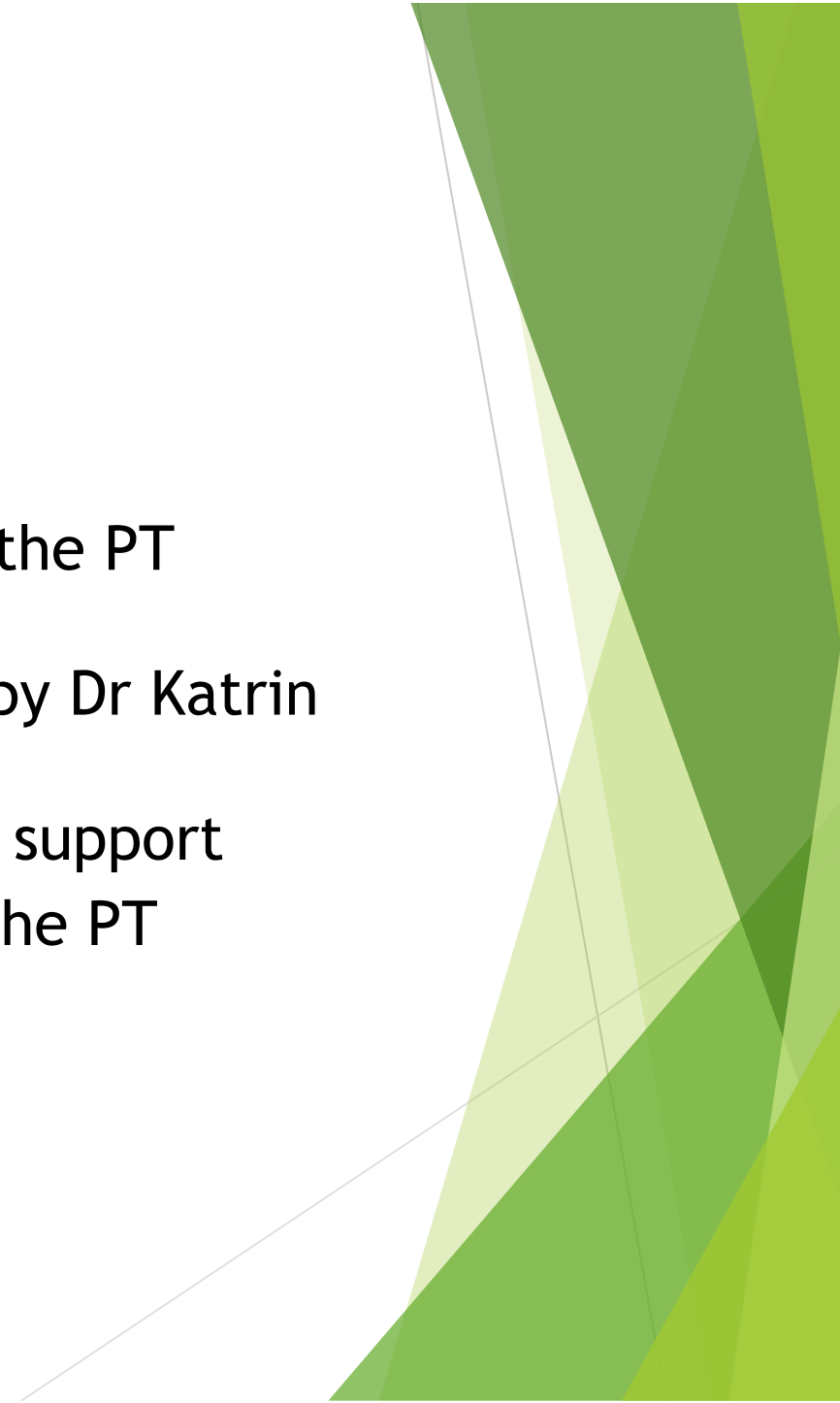
# Challenges with the PT

- ▶ Payment of insufficient fee
- ▶ Technical challenges with transferring fee to BOBS account
- ▶ Incompatible finance systems- late payment of fee
- ▶ Non payment-escalation of PT running costs



# Acknowledgements

- PTB, Germany for support in coordination of the PT scheme
- PTB, Germany for Technical Support offered by Dr Katrin Luden
- SADC MET for coordinating and administrative support
- National Food Agency, Sweden for supplying the PT samples
- All other stakeholders
- All participating laboratories



# End of Presentation

