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Review the status of FMD Laboratory diagnostic capacities in SEACFMD region

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SEACFMD Laboratory Network Meeting
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Outline

- Introduction
  - Objective of survey
  - Survey Methodology
- Findings
  - Diagnostic tests
  - Biosafety and Quality Control
  - Logistics and challenges
  - Technical support
- Conclusion and Way Forward

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Objective of the survey

- To understand the existing laboratory capacity for FMD diagnosis
- To understand the impact of COVID-19 and other emerging diseases, such as Lumpy skin disease (LSD) and African swine fever (ASF) on FMD surveillance at the national level.
- To identify the areas in which support is needed for national-level FMD diagnosis and surveillance.
- To seek recommendations to enhance diagnostic capacity of the members and to strengthen FMD control in SEACFMD Region

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Survey Methodology

- Development of survey questionnaire:
  - WOAH SRRSEA prepared the draft questionnaire
  - Questionnaire further improved with the inputs received from the Experts from FMD Reference Laboratories 2021.
- Questionnaire was shared to SEACFMD Members in Microsoft Form with a request to submit their response virtually
- Members (12 countries) completed online questionnaire
- Analysis and reporting
  - Two countries (FMD Reference Laboratories) have advance diagnostic capacities
  - Descriptive analysis performed
  - Report status and situation at the regional level

Forms

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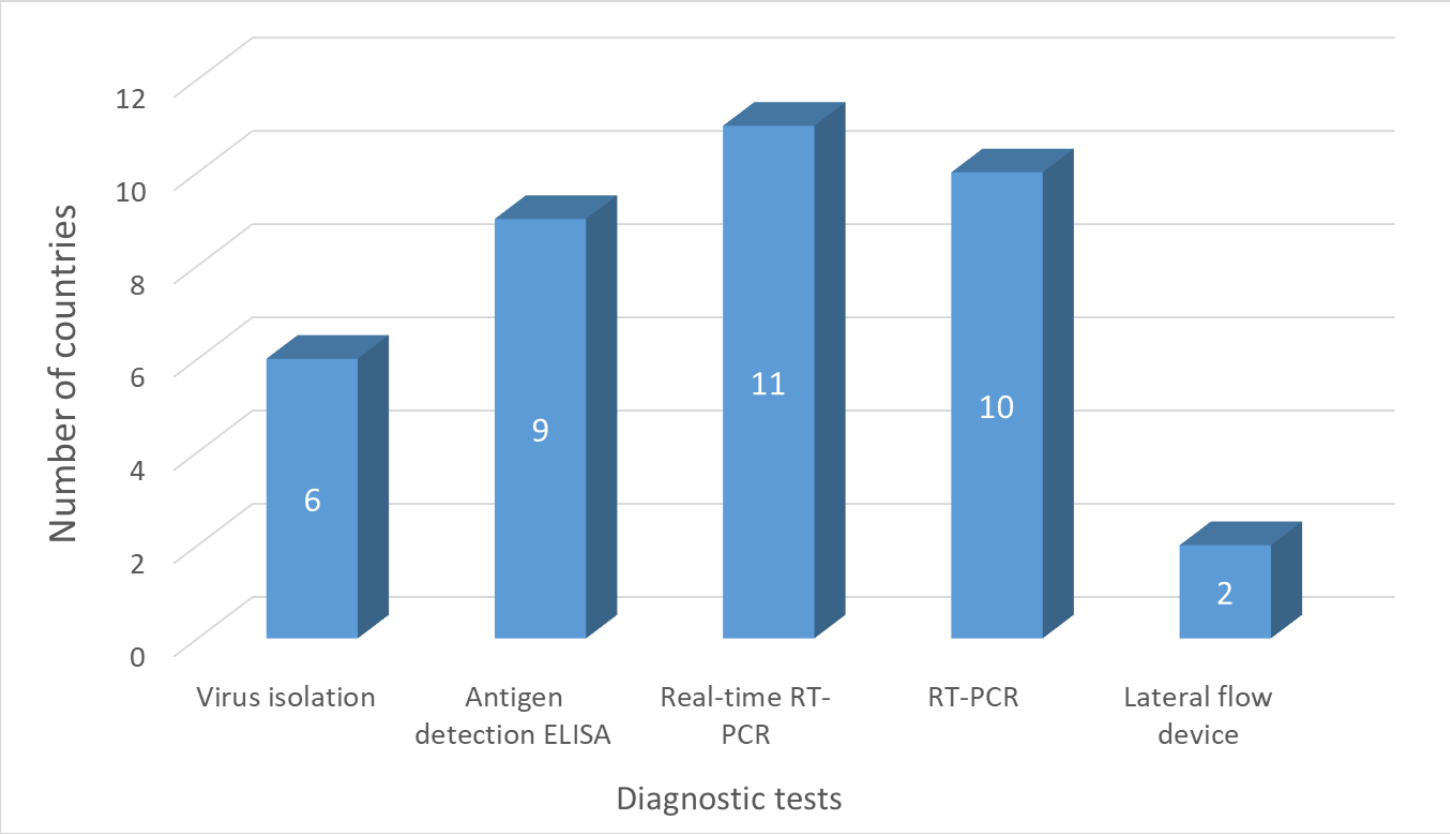
FMD Diagnostic tests – agent identification

Does your country have the capacity to conduct the following laboratory tests for (FMD virological or molecular) agent identification?



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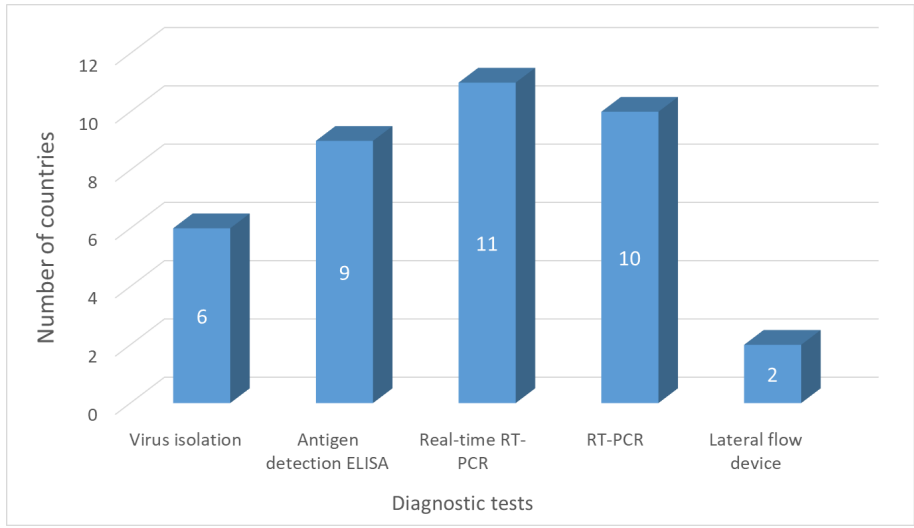
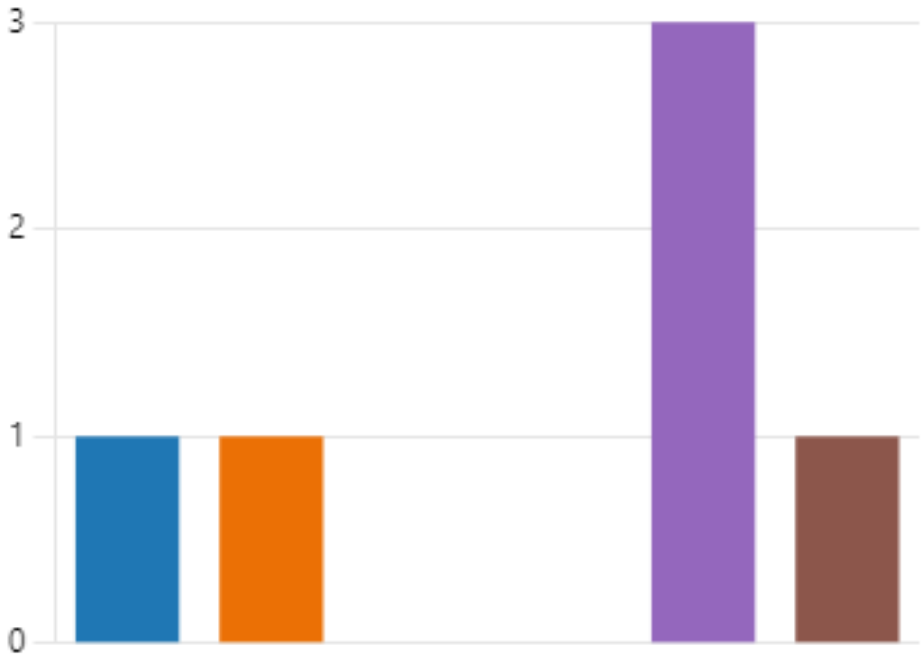
Virus isolation – 6 countries



7. How frequently do you conduct virus isolation?

More Details

Daily	1
Twice a week	1
Once a week	0
Once every two weeks	0
Once a month	3
Once every 6 months	1



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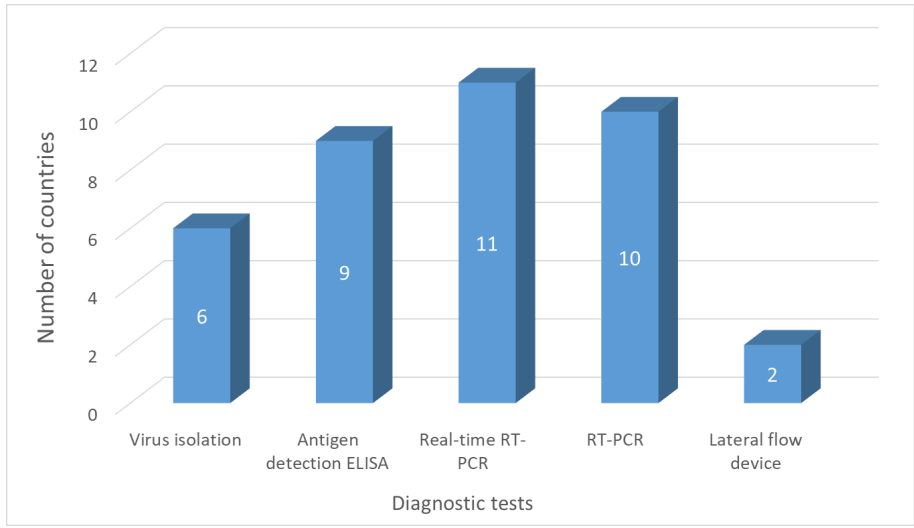
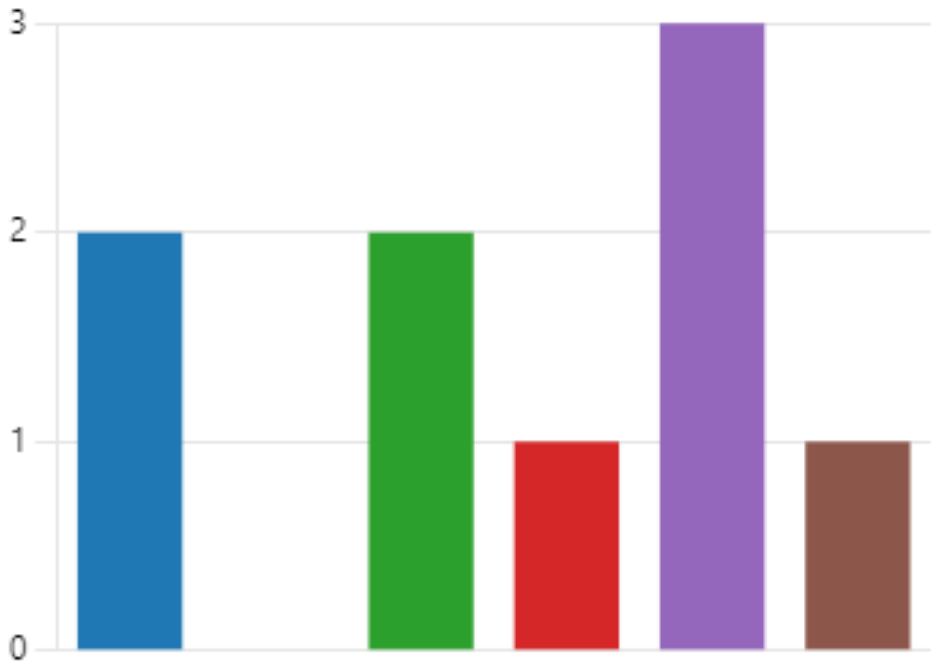
Antigen detection ELISA – 9 Countries



10. How frequently do you conduct Antigen detection ELISA?

More Details

Daily	2
Twice a week	0
Once a week	2
Once every two weeks	1
Once a month	3
Once every six months	1



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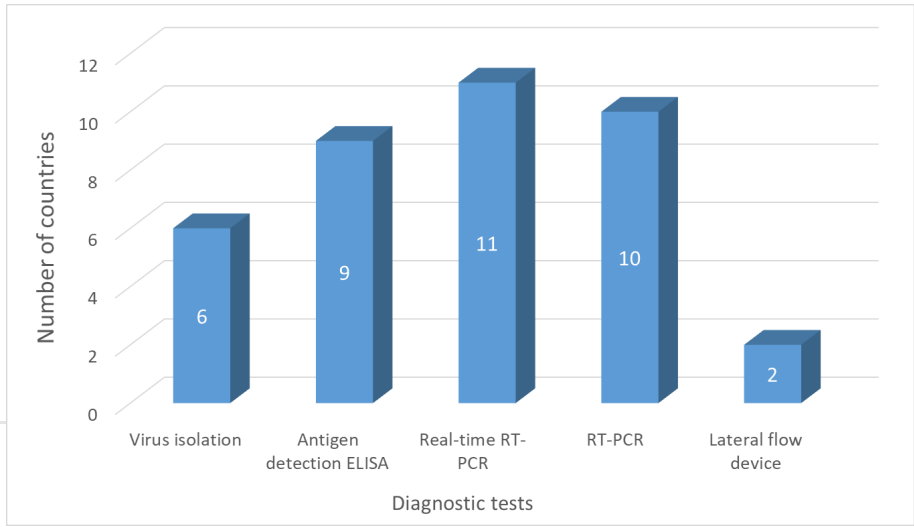
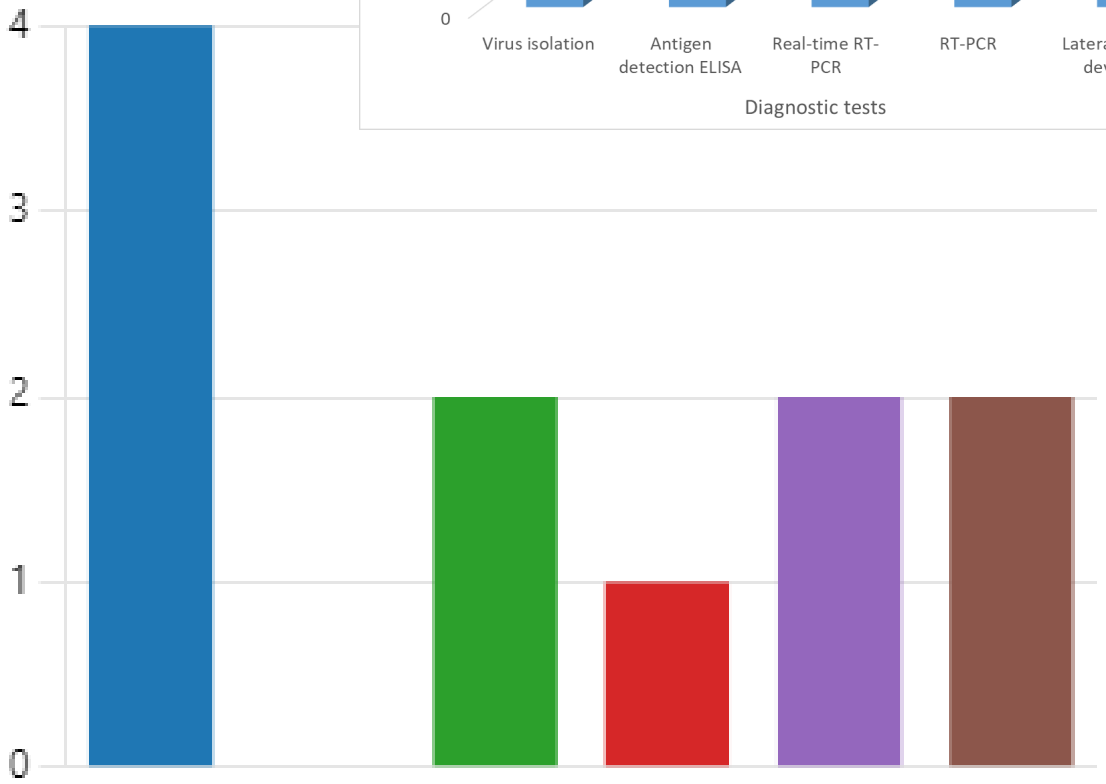
Real-time RT-PCR – 11 Countries



Daily	4
twice a week	0
Once a week	2
Once every two weeks	1
Once a month	2
Once every six months	2



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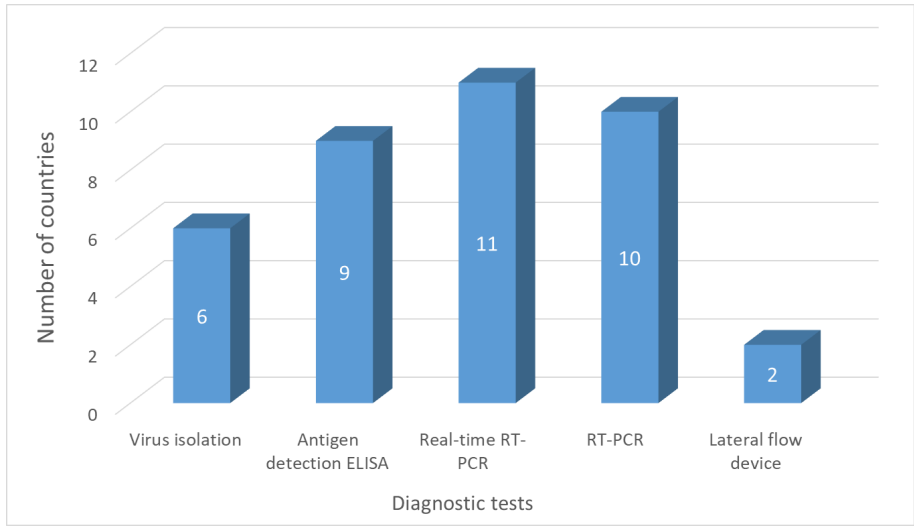
RT-PCR – 10 Countries



Daily	1
Twice a week	2
Once a week	2
Once every two weeks	2
Once a month	2
Once every six months?	1

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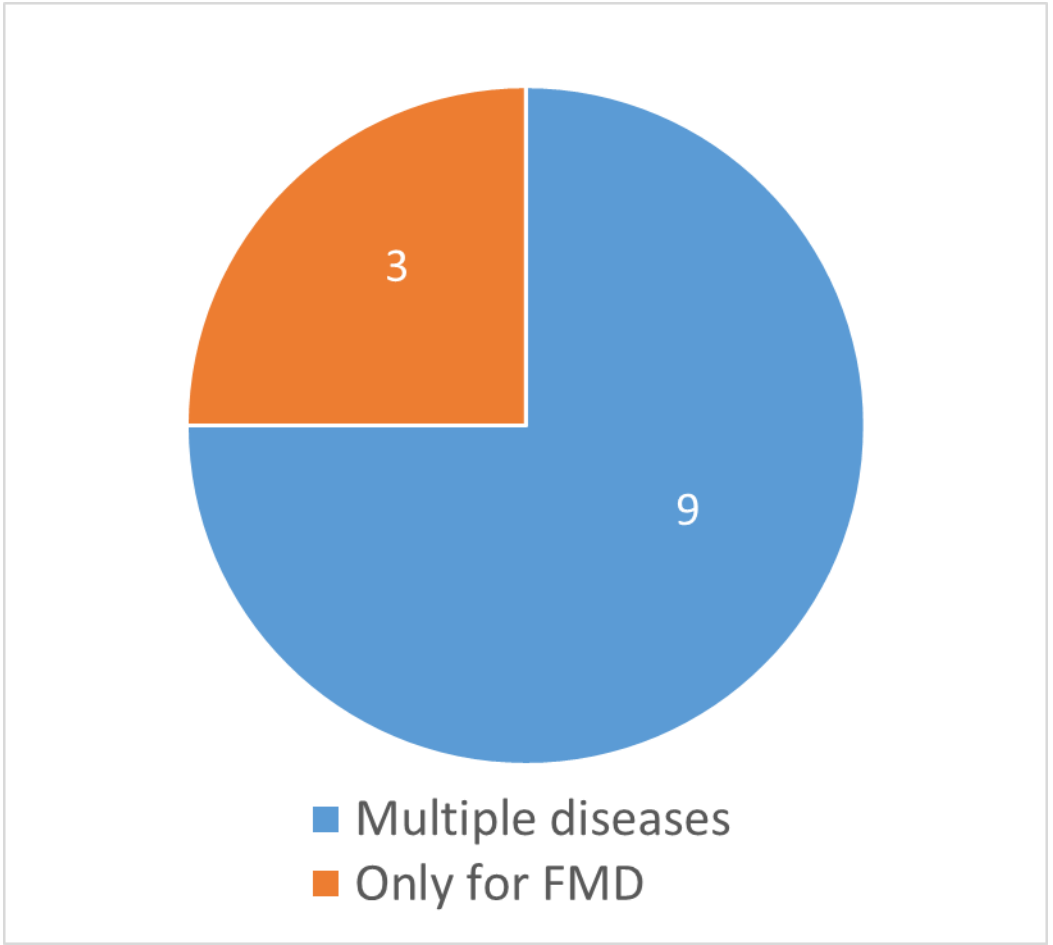
PCR Machines

How many FMD diagnostic PCR machines are available in your laboratory for antigen detection using molecular techniques?

All laboratories have PCR Machine
1 to 6 PCR Machines

Is this PCR equipment designed for multiple diagnoses or only for specific disease diagnosis?



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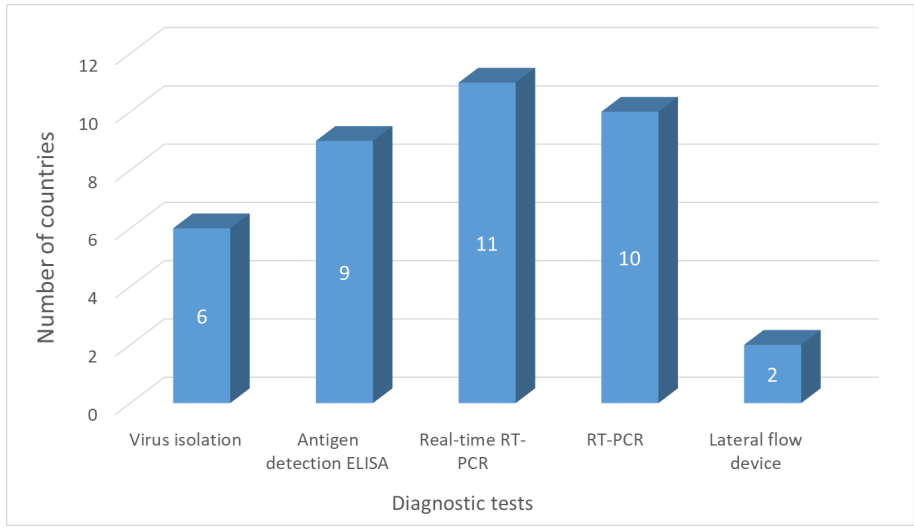
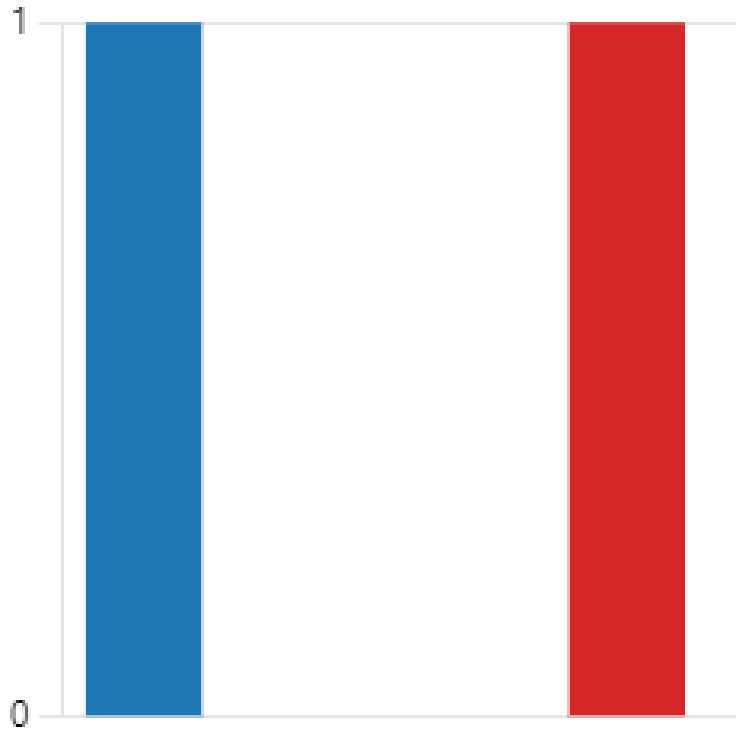
Lateral flow device – 2 Countries



Once a day	1
Twice a week	0
Once a week	0
Once every two weeks	1
Once a month	0
Once every six months	0



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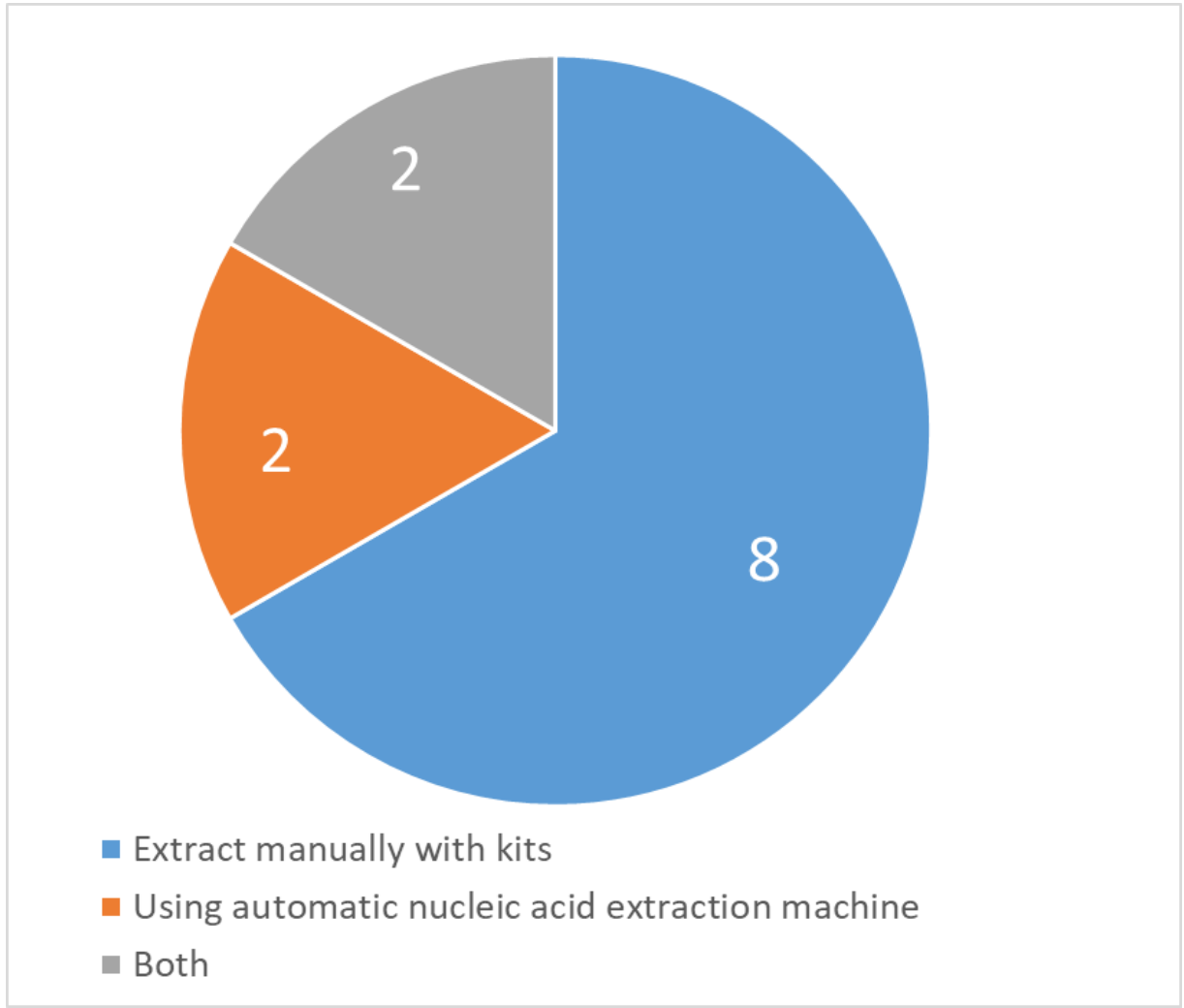
FMD Diagnostic tests – agent identification

Do you extract DNA from field samples manually or using automatic nucleic acid extraction machine?



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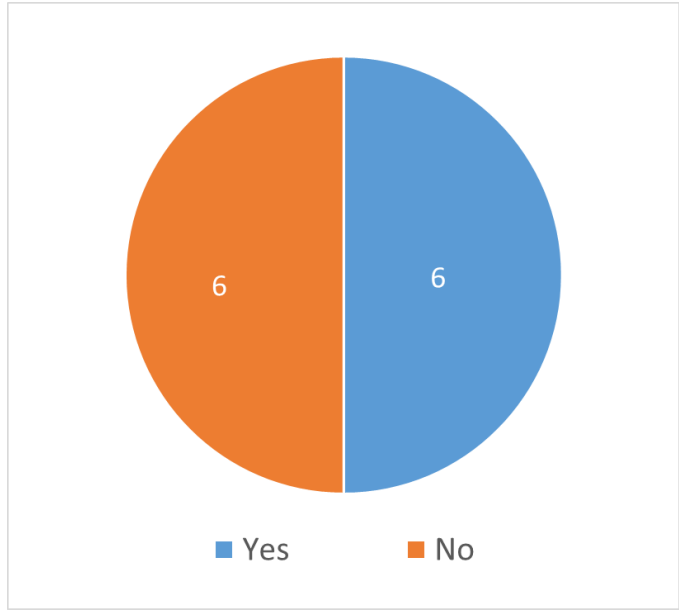
Sequencing capability and capacity

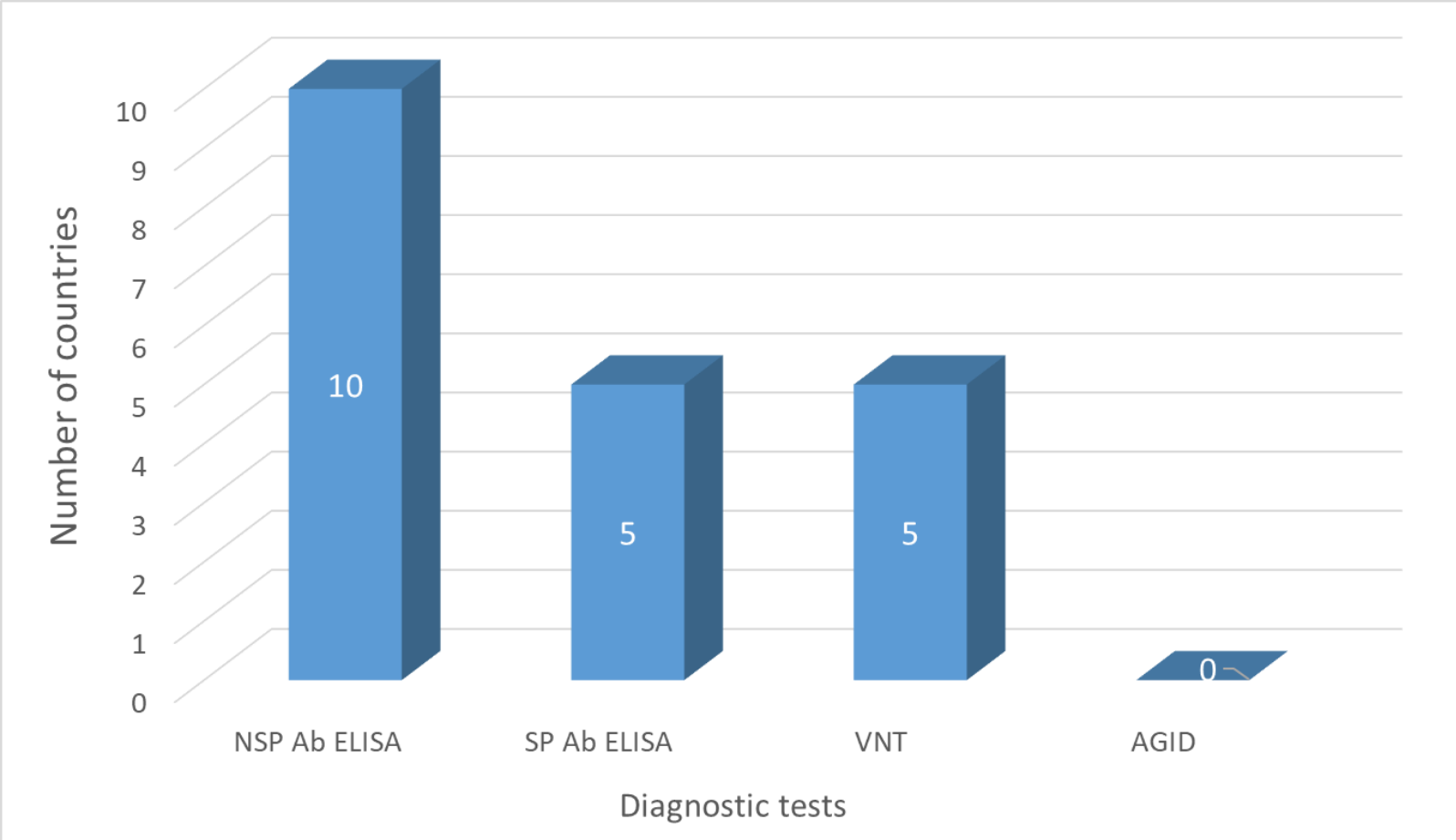
Does your laboratory has sequencing capacity?



Sequencing Platform
MinION but still under development
ABI-3130
Sangar sequencing (outsource) and next generation sequencing
VP1 sequencing
Sanger sequencing, VP 1 characterization
VP1 Sequencing

FMD Diagnostic tests – Immune response

Does your country have the capacity to conduct the following laboratory tests for detection of immune response?



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FMD Diagnostic tests – Immune response

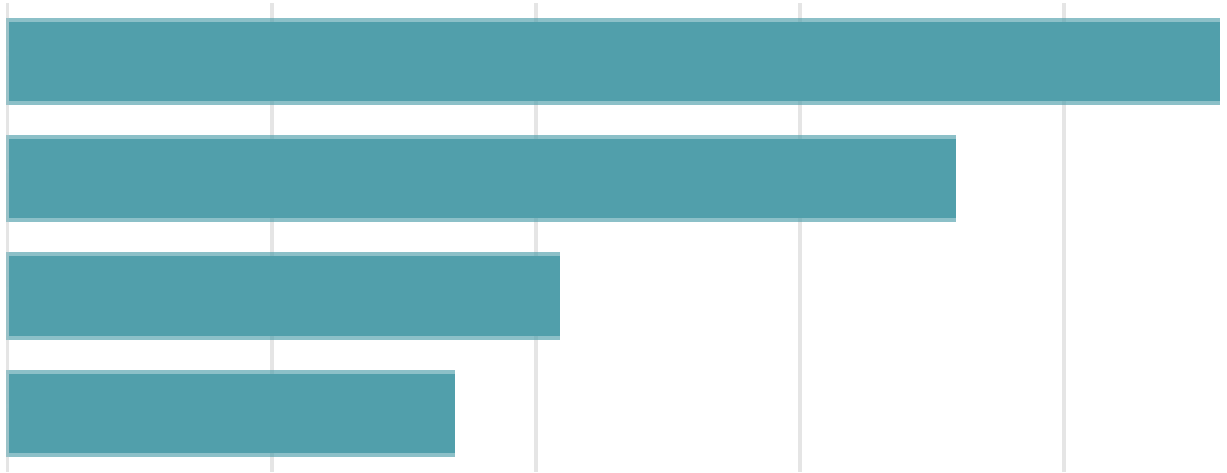
Rank these tests for detection of immune response as per usage/ frequency of use?

1 NSP Ab ELISA

2 SP Ab ELISA

3 VNT

4 AGID



Biocontainment classification of the laboratory

What is the biocontainment classification of the laboratory where you perform routine diagnosis for FMD?

BSL 1	0
BSL 2	8
BSL 2+	5
BSL 3	2

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Quality control in the laboratory

What quality standards are implemented in your laboratories?

MS ISO/IEC 17025:2017
WAOH standard method.
ISO/IEC 17025
MNS ISO 17025
ISO/IEC 17025:2017
ISO/IEC 17025:2017
BSL 2
NA
ISO 17025 2017, **ISO 9001 2015**, **ISO 45001 2018, ISO 37001 2016**
ISO 9001:2015
ISO17025:2017
OIE standards

7 Members –
ISO/IEC 17025: 2017

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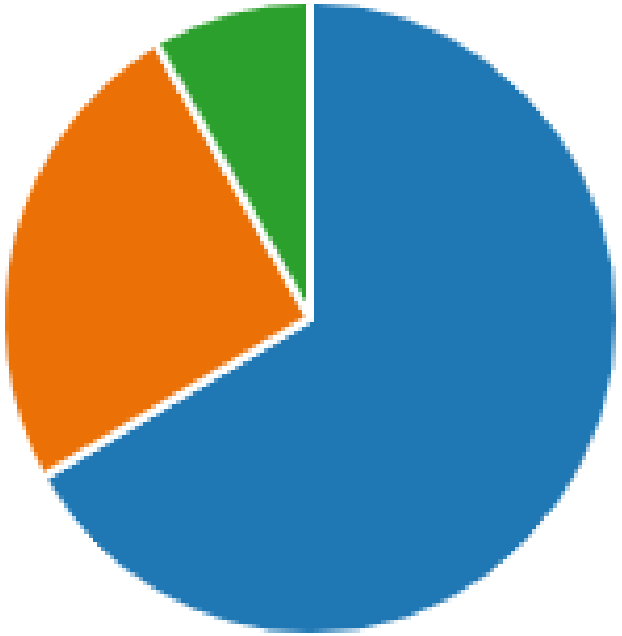
Quality control in the laboratory

Are your laboratory assays for FMD accredited by national or international body?

Accreditation by national body	8
Accreditation by international b...	3
Not accredited	1



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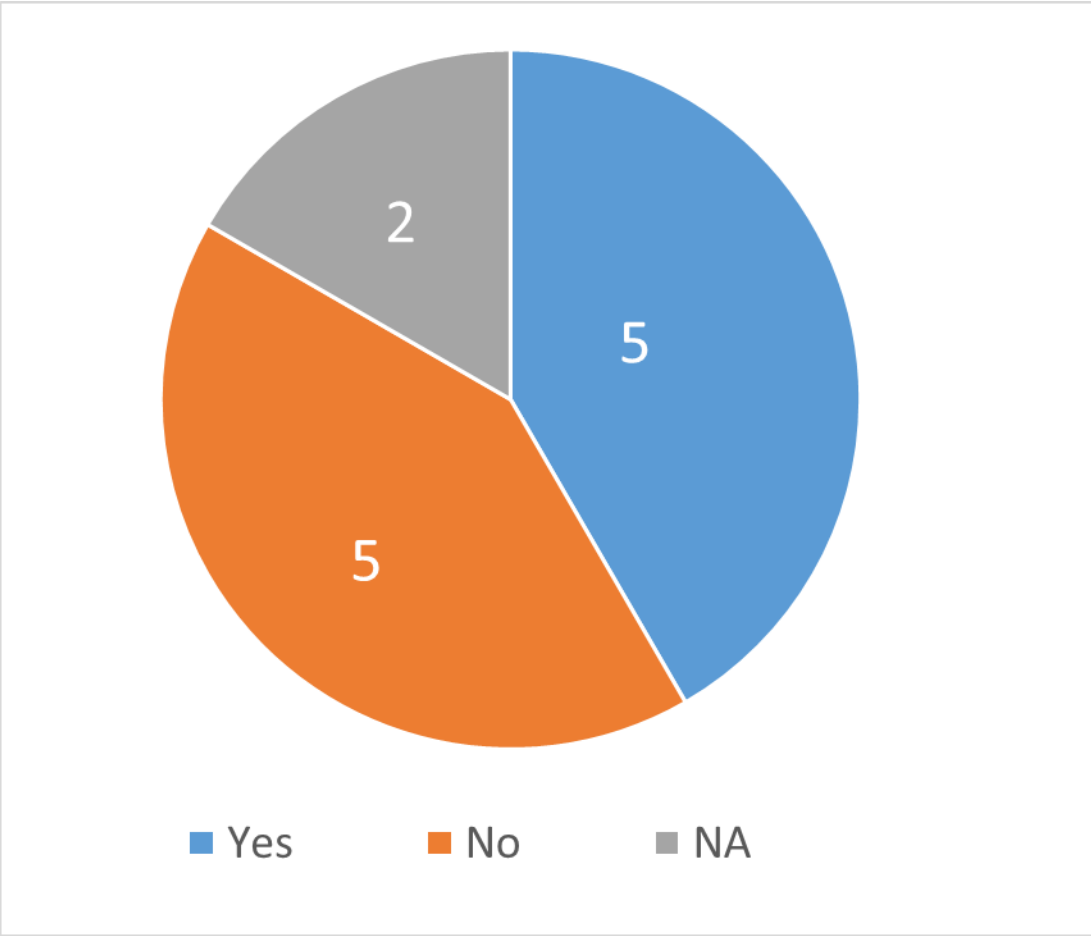
Samples send to Reference Laboratories



WRL Pirbright	3
RRL Pak Chong	1
NIAH Japan	1

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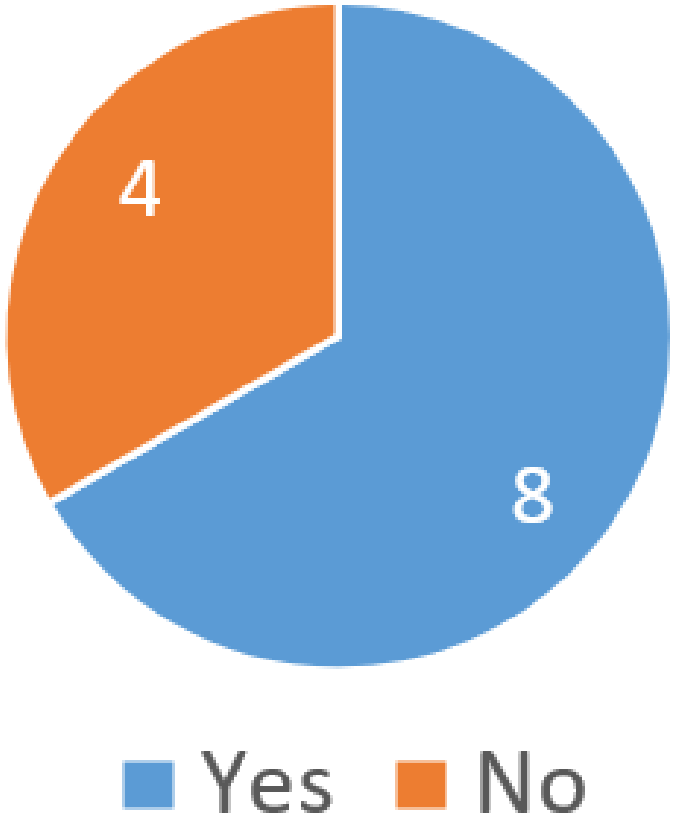
Proficiency testing

Does your laboratory participate in Proficiency test (PT) Scheme?



RRL Pakchong	3
Vetqas	1
WRL Pirbright	2
ARRIAH Russia	1
FAO	1

LVRI Lanzhou provide reference materials to provincial Laboratories

How frequently do you participate in PT scheme?

Twice a year	1
Once a year	5
Once every 2 years	1

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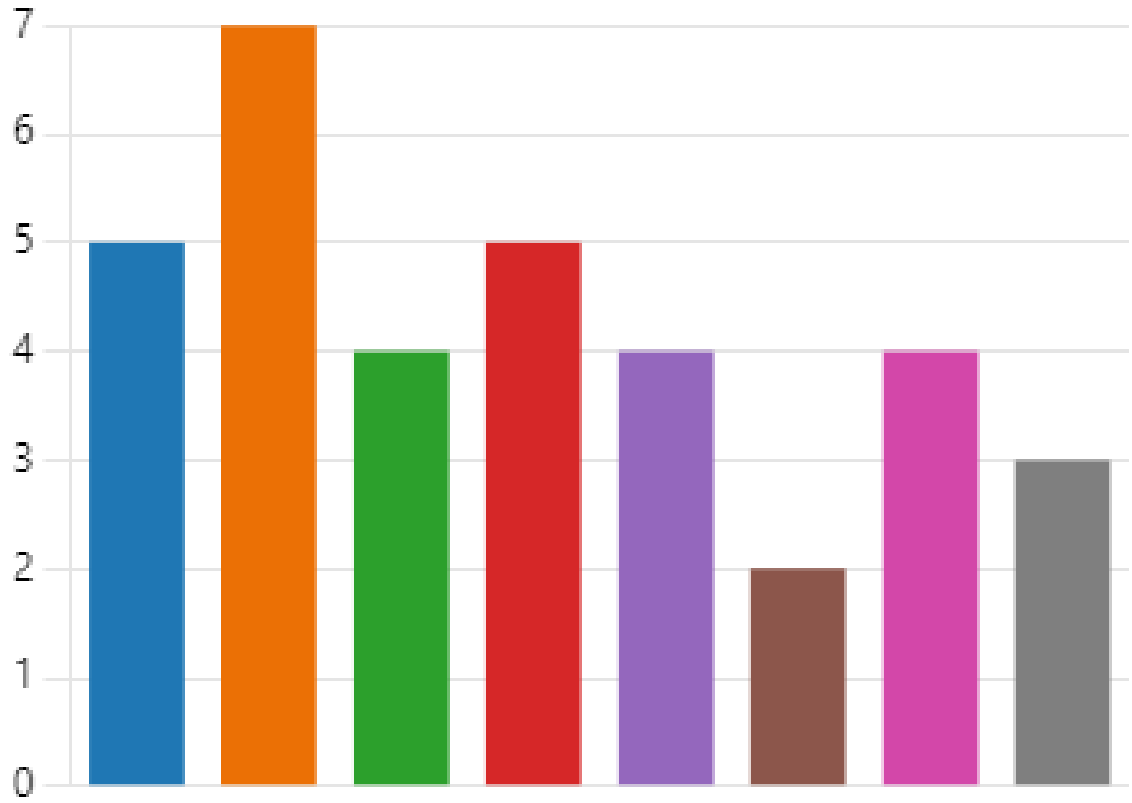
Challenges in diagnosis of FMD

What are the main challenges in your country in diagnosis of FMD?

Lack of the human resources	5
Lack of the financial resources	7
Accessibility of diagnostic kits, r...	4
Availability of kits, reagents, and...	5
Lack of technical capacity	4
Poor laboratory infrastructure/ li...	2
Poor reporting and submission ...	4
Others	3



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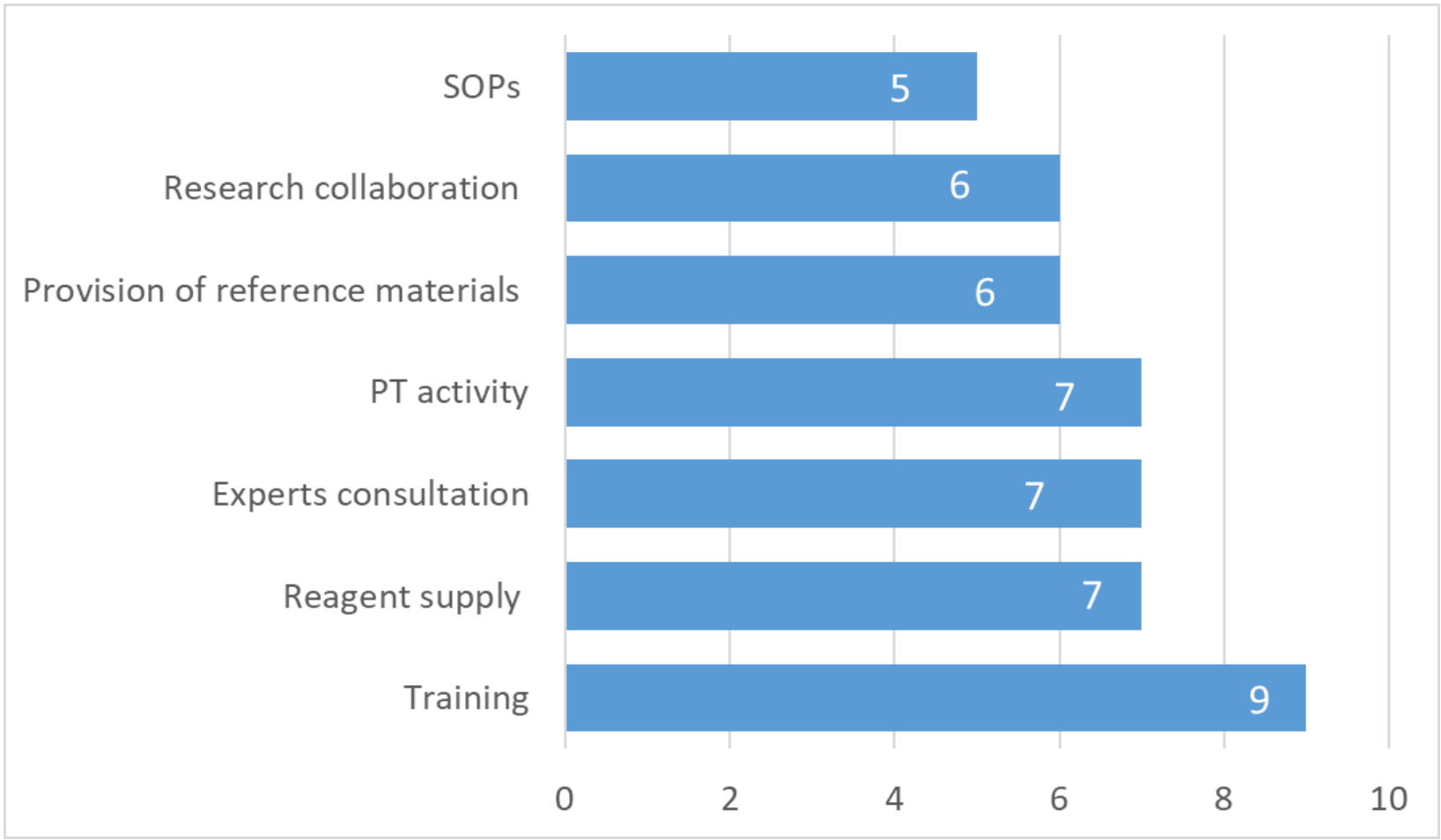
Expected technical support

Technical support expected from WOAH/ FAO/ Partners and Reference Laboratories?



Excludes Lanzhou and Pakchong

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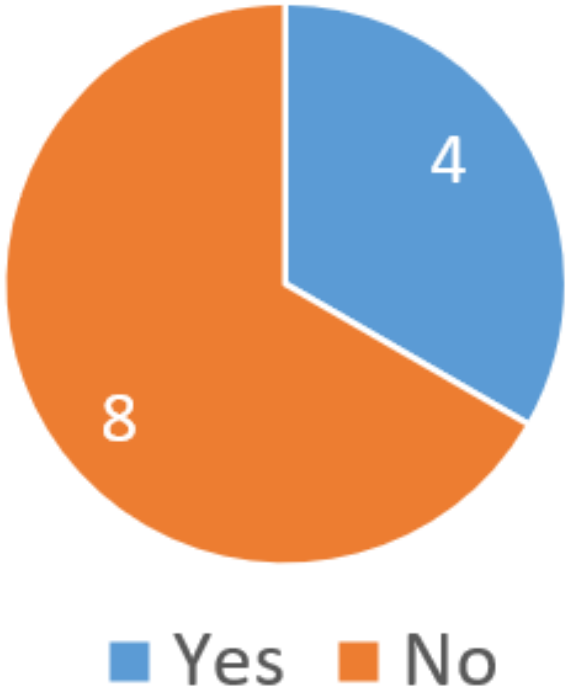
Training topics - If you could avail training on FMD laboratory diagnosis, what topics you wished to be covered in the training?

The multiplex for FMD virus for serotyping, the whole genome sequence and also phylogenetic analysis; LPBE and SPCE.
Validation of ELISA test capacity especially Antigen test and qualify sample preparation; Need more capacity on RT-PCR.
FMD serotyping
virus isolation and VNT test
Update on new diagnosis methods including molecular and serology methods
Isolation and sequecing
QA and QC
vaccine
Differential diagnosis
Serotyping qRT PCR and sequencing
Bioinformatics analysis
Vaccine matching and bioinformatics

Did COVID-19 impact your labs performance?

If COVID-19 impacted your lab performance, please provide information regarding the challenges that affected FMD surveillance?



Receiving few samples during the FMD outbreaks. Still difficult to go to the field for sample collection and survey due to movement restriction
Although our laboratory is not involved with COVID-19 testing, manpower is reduced due to restrictions in commuting to work, causing strains in laboratory testing.
Decreased sample submission for surveillance Delays in delivery of purchased reagents or kits Accessibility of lab kits and reagents and consummables Lack of personnel in sample collection and testing
Sometimes, body conditions of staff problem, and slowly training face to face.

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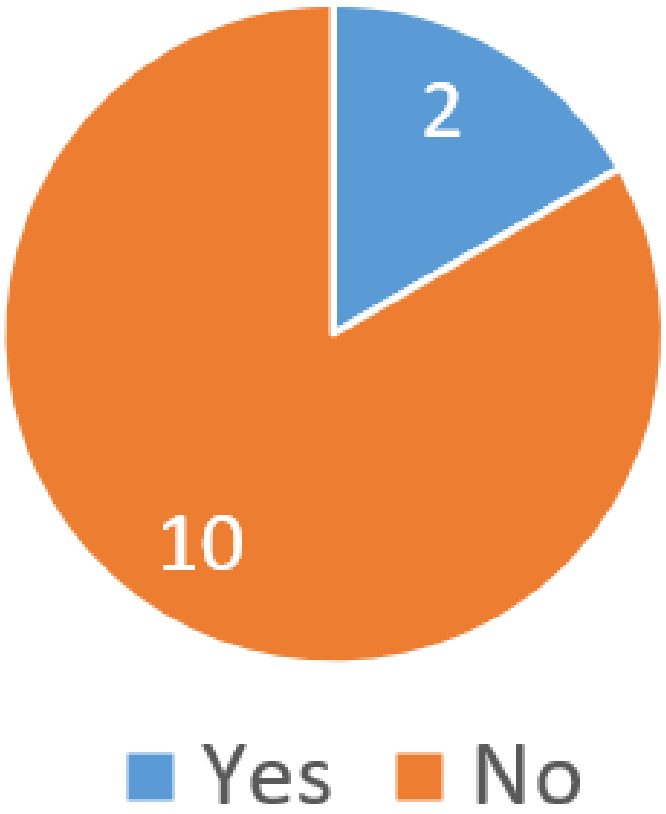
Is your laboratory impacted by the emergence of ASF or LSD in your country?

If impacted by emergence of ASF and LSD, please provide information regarding the challenges that have arisen in FMD surveillance in your country?



Resources are channeled for the testing of ASF and LSD.
Less budget allocation for FMD surveillance, focus is on ASF surveillance

Any other comments to improve FMD laboratory diagnosis in your country?

- Sufficient number of trained manpower required
- Fund support for reagents and equipment
- Training to improve and strengthen the capability of the laboratory.
- Regular FMD vaccination campaign in FMD control zone and Disease Control Zone.
- Implementation of joint research projects/ collaborative research
- Update on the circulating strains in the region as well as on the diagnostics methods to be used (for the free countries)
- Enhance laboratory capacity on pan serotype detection, serotyping multiplex qRT-PCR and sequencing.
- To understand more on FMD serotyping

Conclusion

- This survey provides useful information on:
  - the existing and diverse laboratory capacities
  - for FMD diagnosis
  - Main challenges faced by the Members
  - Expectation of Members from WOAH/ Partners and RL
- Provide some recommendations to enhance FMD diagnosis and surveillance
- Way forward
  - Seek additional information from some Members
  - Detail analysis will be done and report prepared along with key recommendations
  - Develop training plan..... based on needs
  - Findings will be used to enhance FMD diagnostic capacity in the SEACFMD region as well as to provide targeted support to the Members by WOAH and other Partners

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Thank You