



**The Abdus Salam  
International Centre for Theoretical Physics**



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Measurement Uncertainty**

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**The questionnaire result on analytical capability ALMERA member's laboratories**

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# Questionnaire Results on Analytical Capability of ALMERA Member's Laboratories

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# Background

- ❑ In 2000 the 1<sup>st</sup> questionnaire survey on radioanalytical capability of ALMERA member laboratories
- ❑ The information is now 6 years old
- ❑ As of 2006, the number of ALMERA laboratories has come up to 107 laboratories from 67 countries
- ❑ Upgrade of data



# Purpose of the 2<sup>nd</sup> questionnaire

- ❑ To **upgrade the database** concerning radioanalytical facilities and abilities
- ❑ To investigate how many laboratories of ALMERA member are implementing the **R&D activity** concerning **NORM**
- ❑ To estimate that which type of **reference materials** will be required in the future
- ❑ To make appropriate decisions concerning **training** of IAEA fellows, **scientific visitors, provision of experts, international projects,** characterization of **reference materials**
- ❑ To give information on **analytical capability to MS** suffers from emergency event



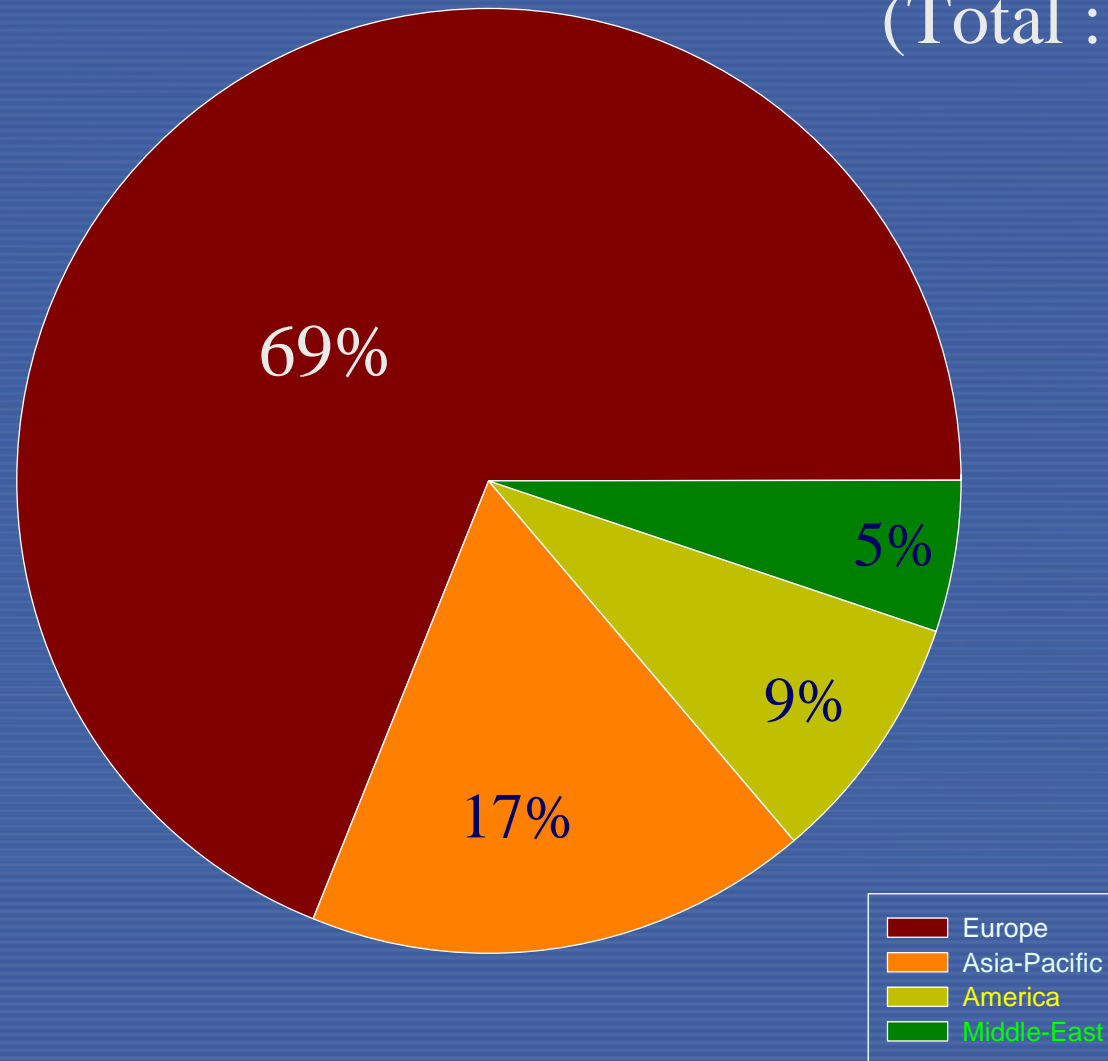
# Questionnaire form

- ❑ Consists of **24 questions** including the personnel information of contact person
- ❑ Request all ALMERA member to response to the questionnaire

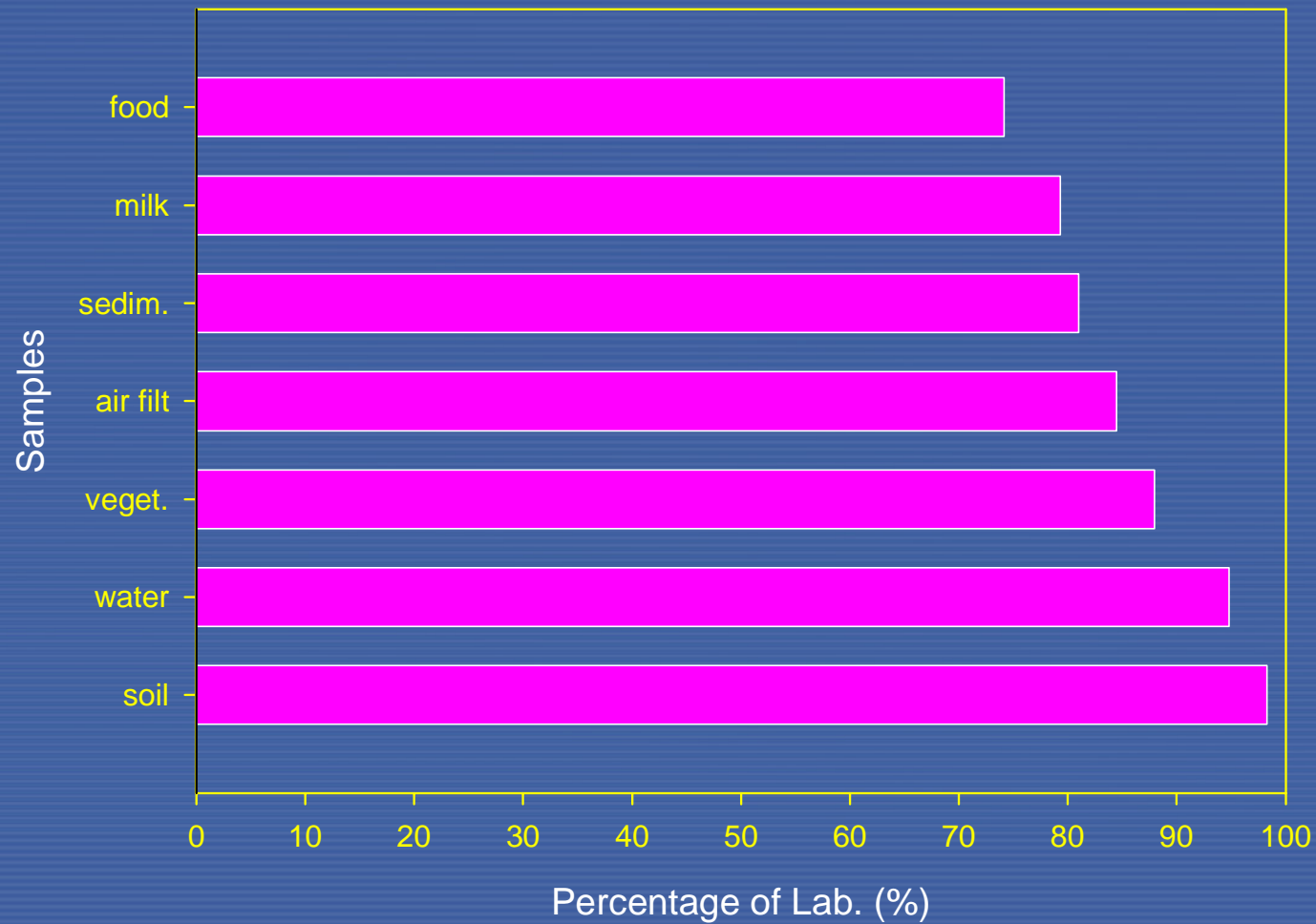


# Countries responded to questionnaire

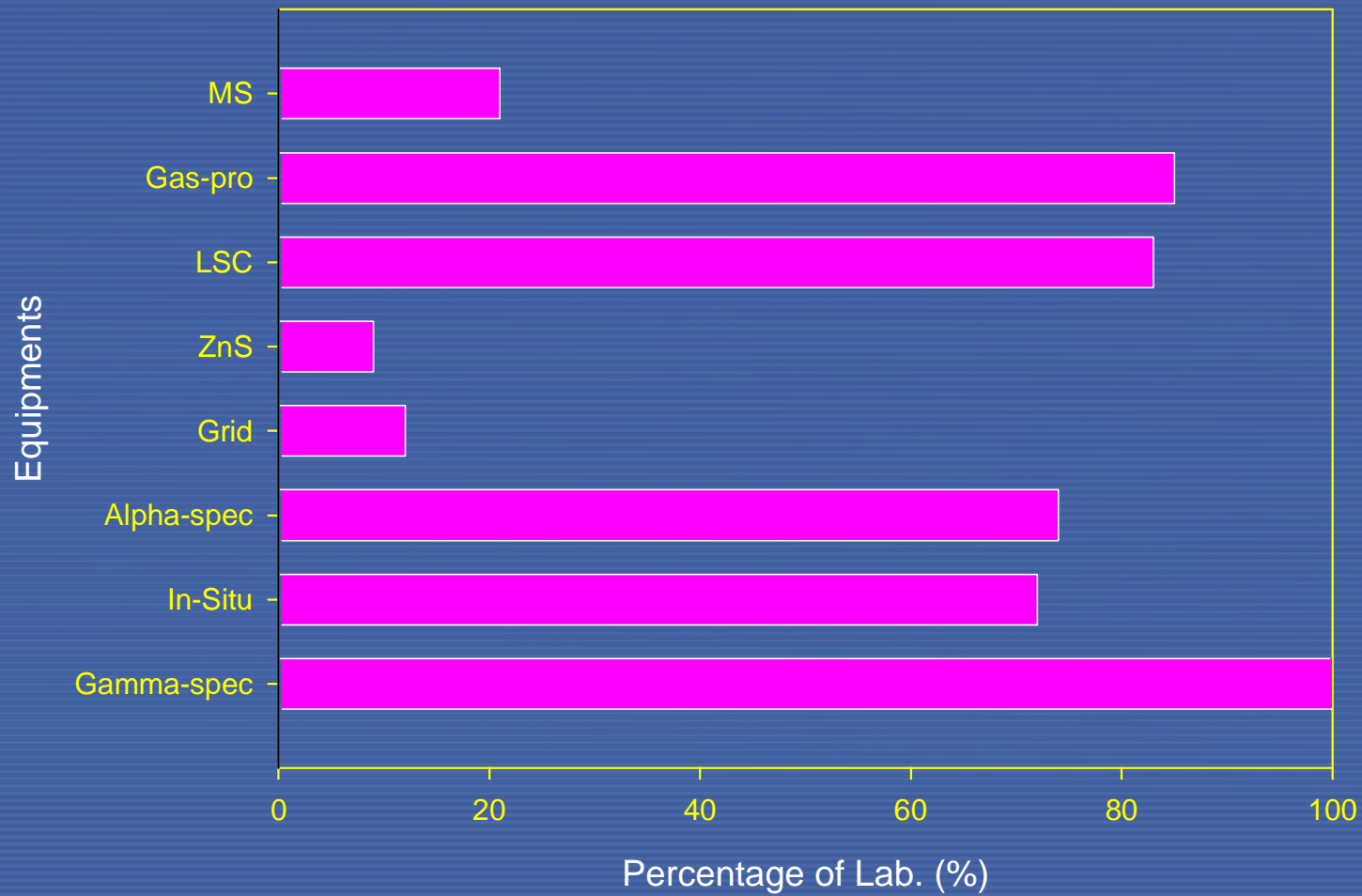
(Total : 59 Lab.)



# Percentage of ALMERA Lab of analyzing by sample matrix

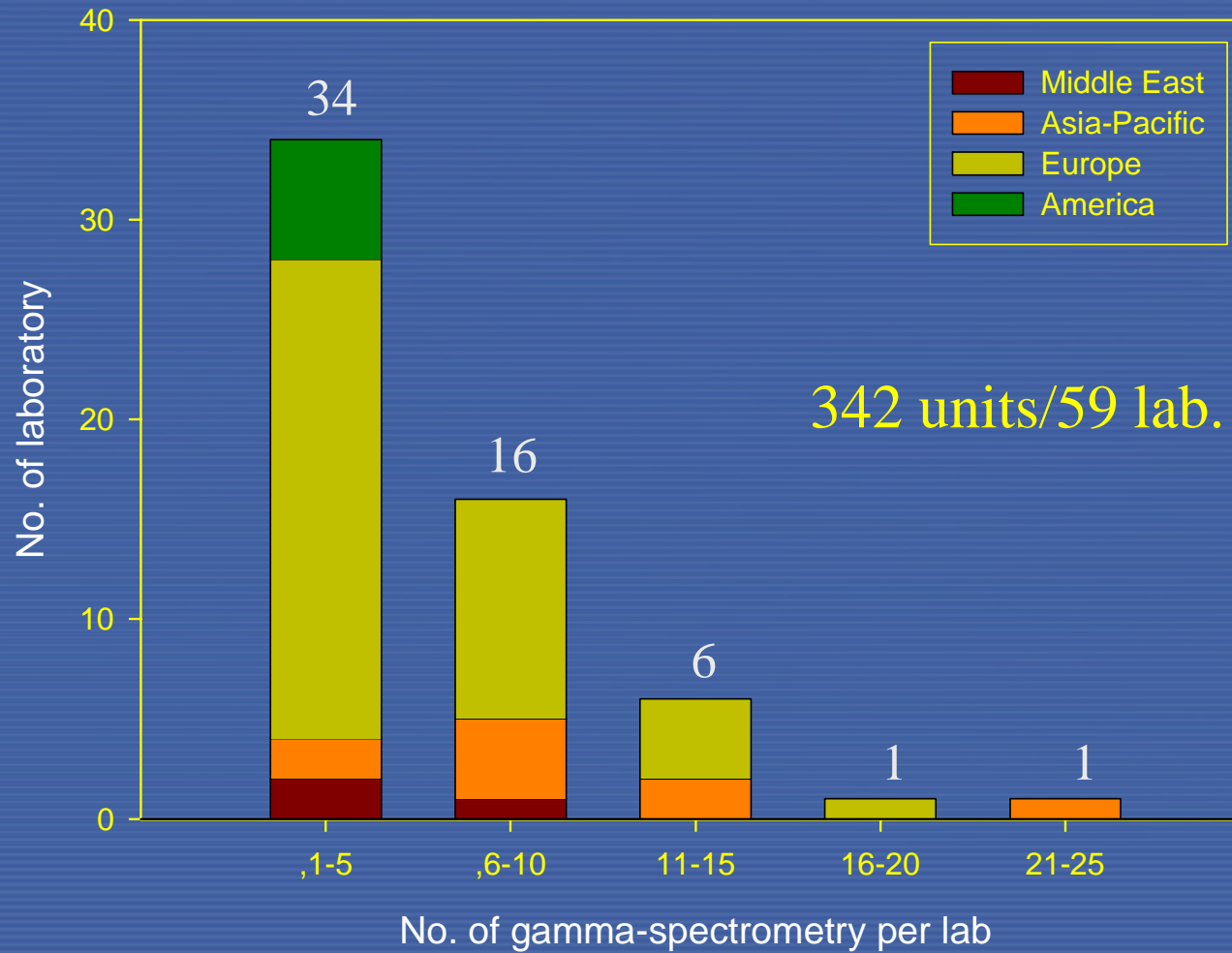


# Percentage of ALMERA Lab of holding equipments

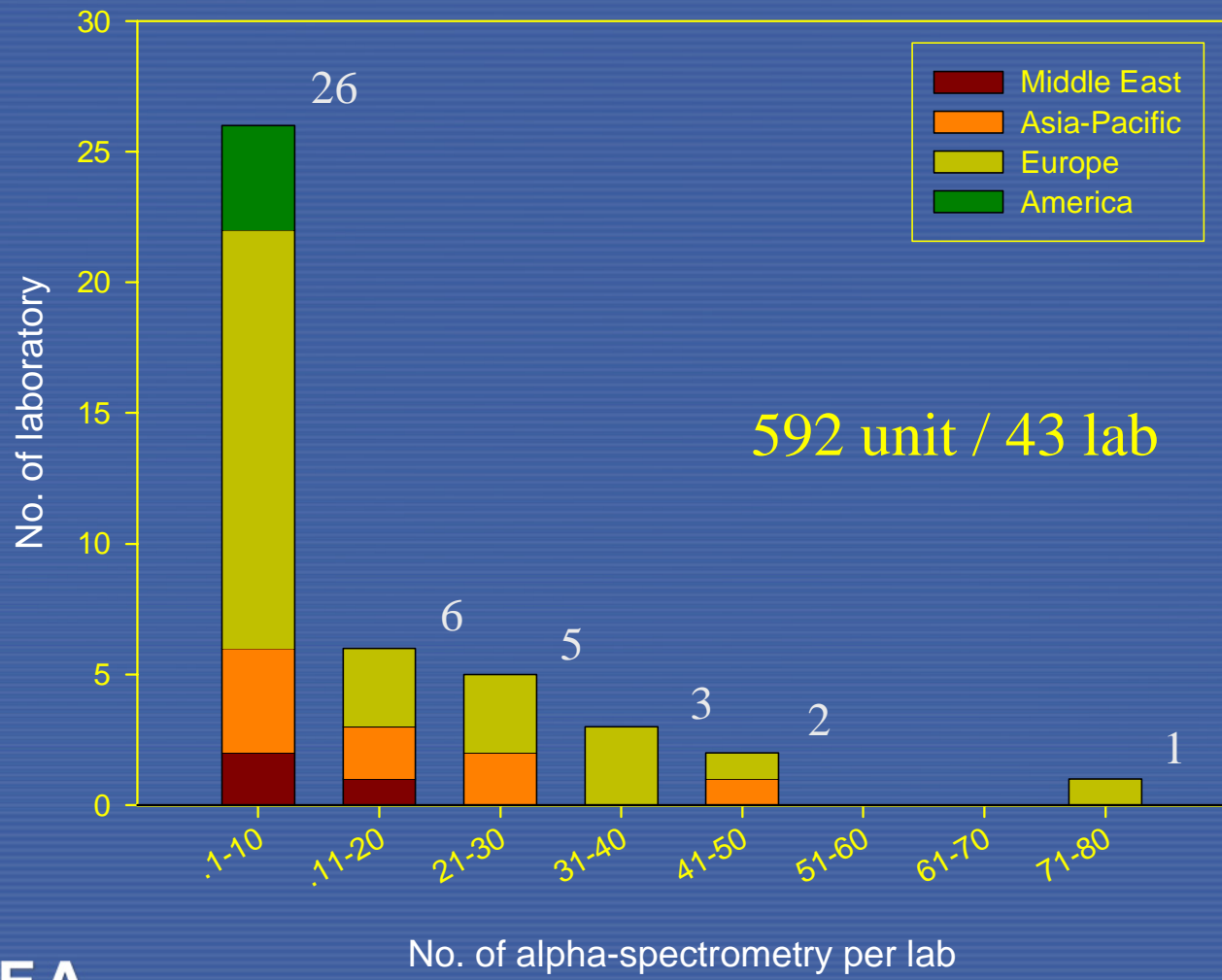




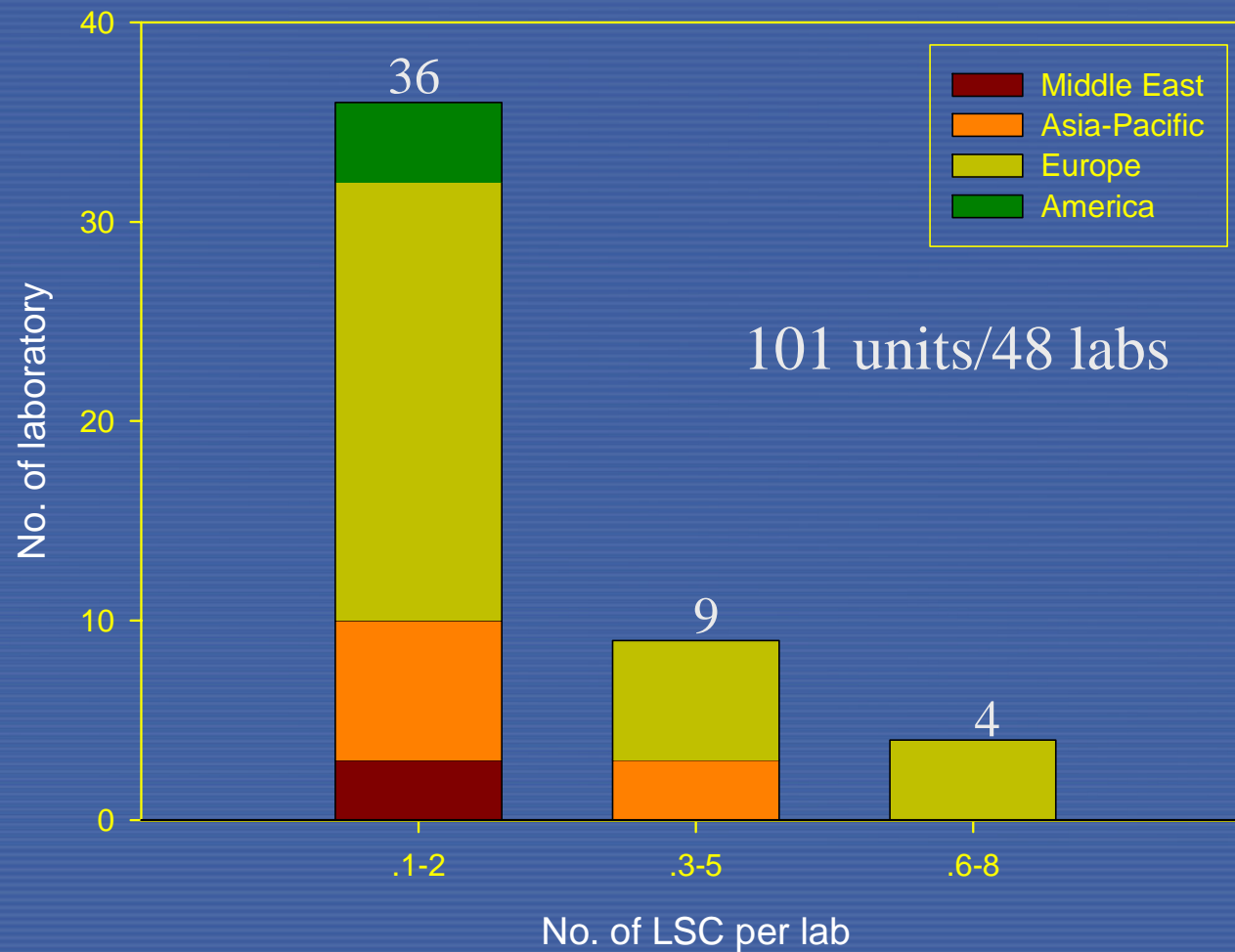
# Regional distribution of ALMERA Lab of holding gamma-spectrometry



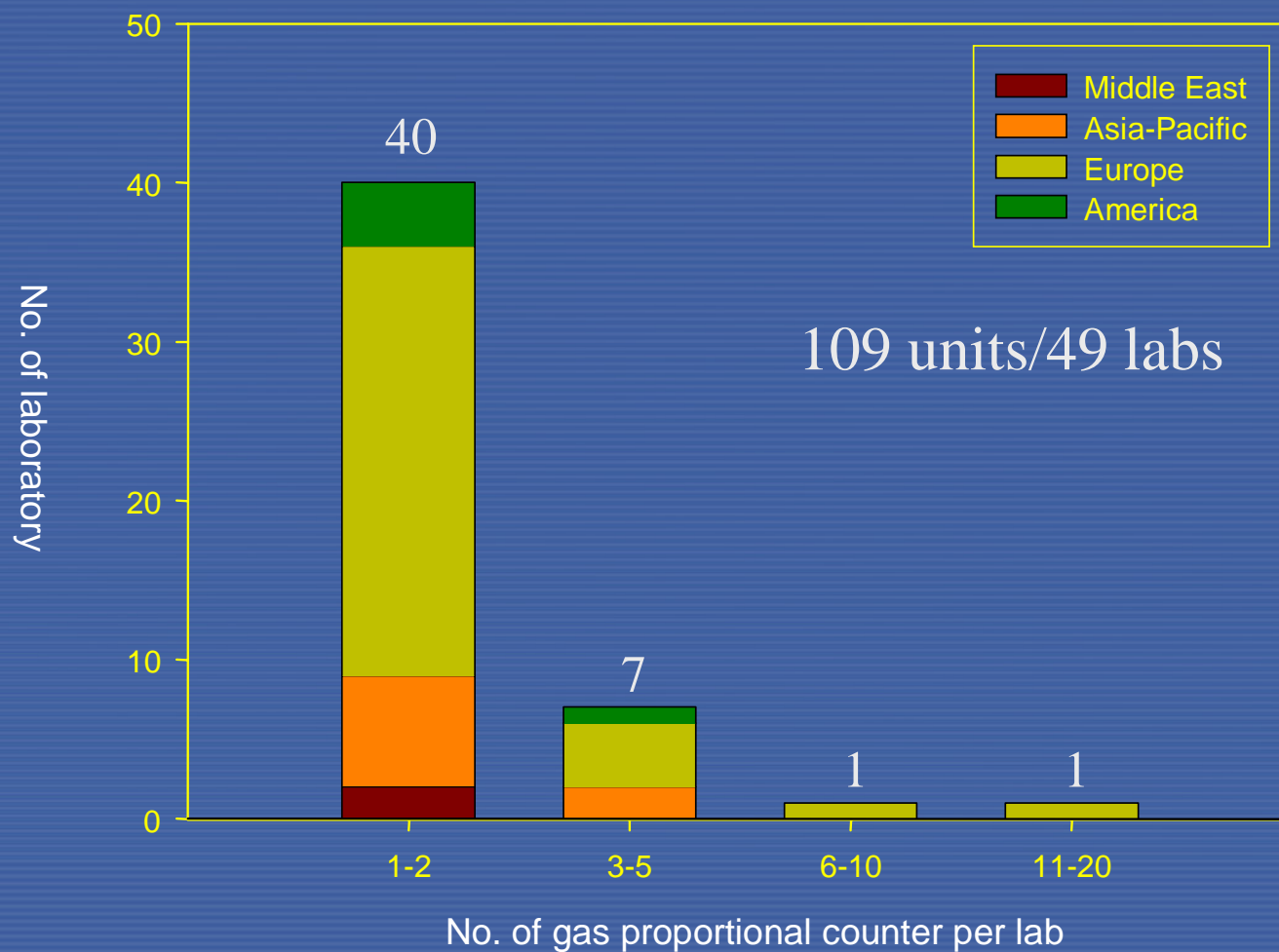
# Regional distribution of ALMERA Lab of holding alpha-spectrometry



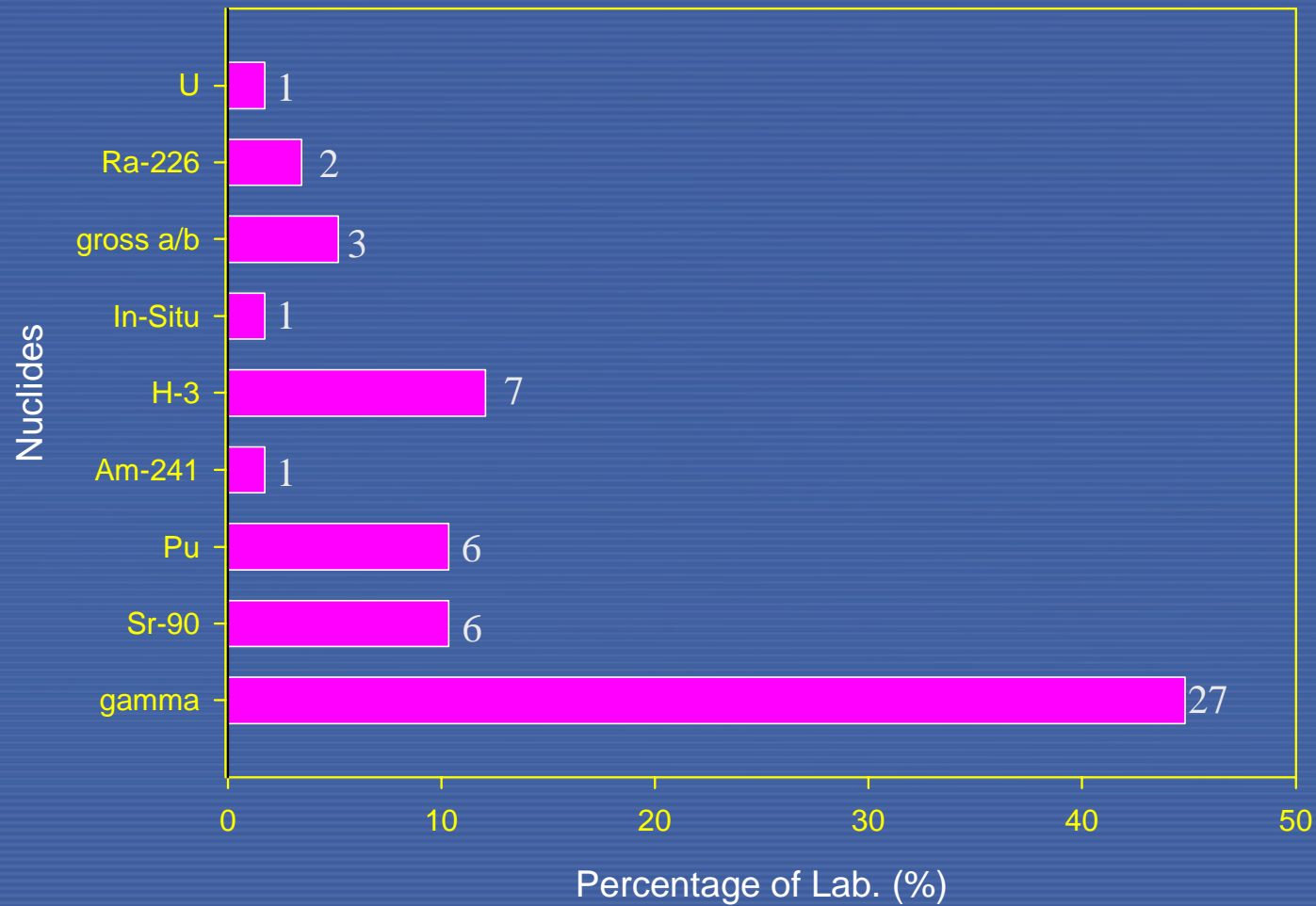
# Regional distribution of ALMERA Labs of holding LSC



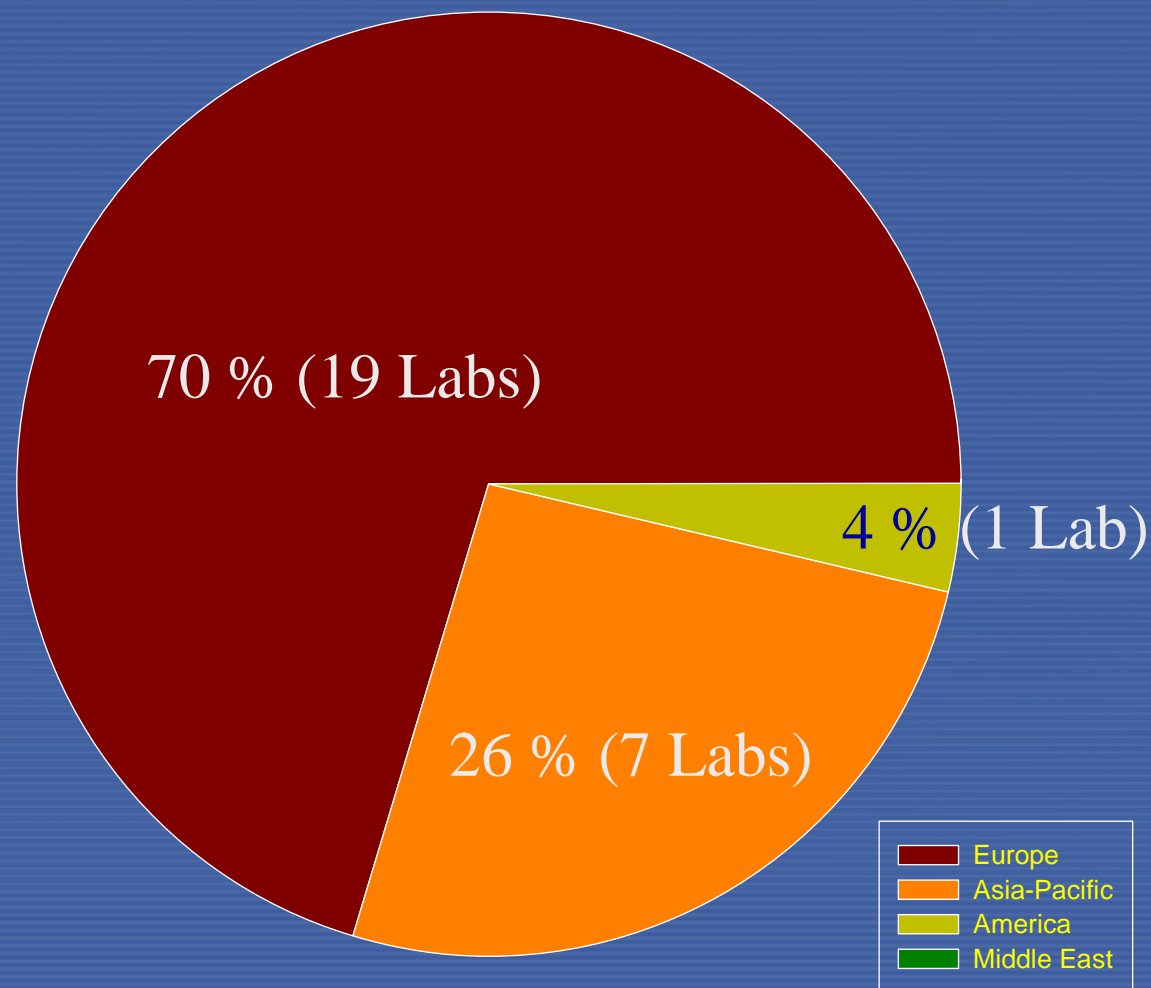
# Regional distribution of ALMERA Labs of holding gas proportional counter



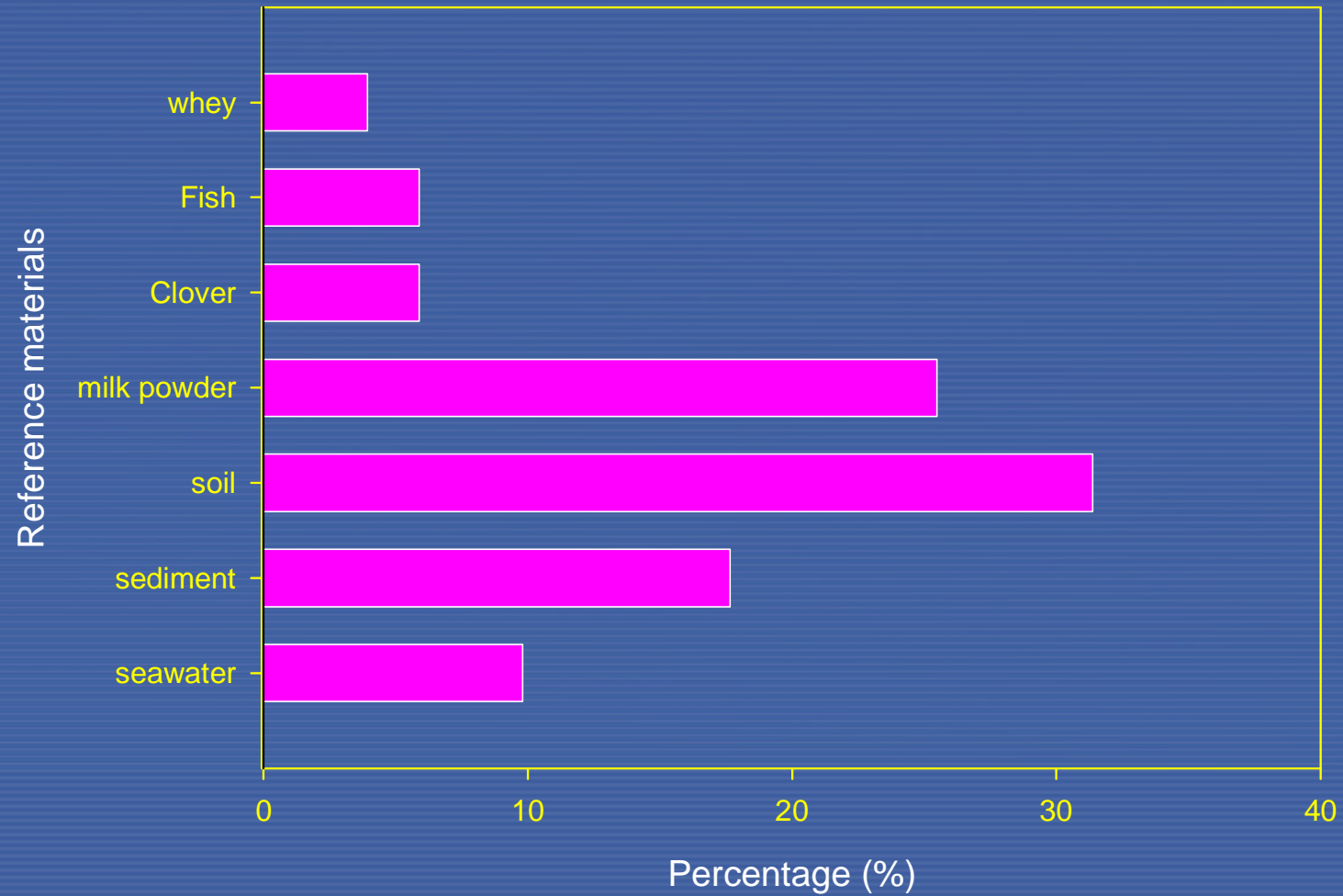
# Percentage of Lab. accredited with ISO 17025



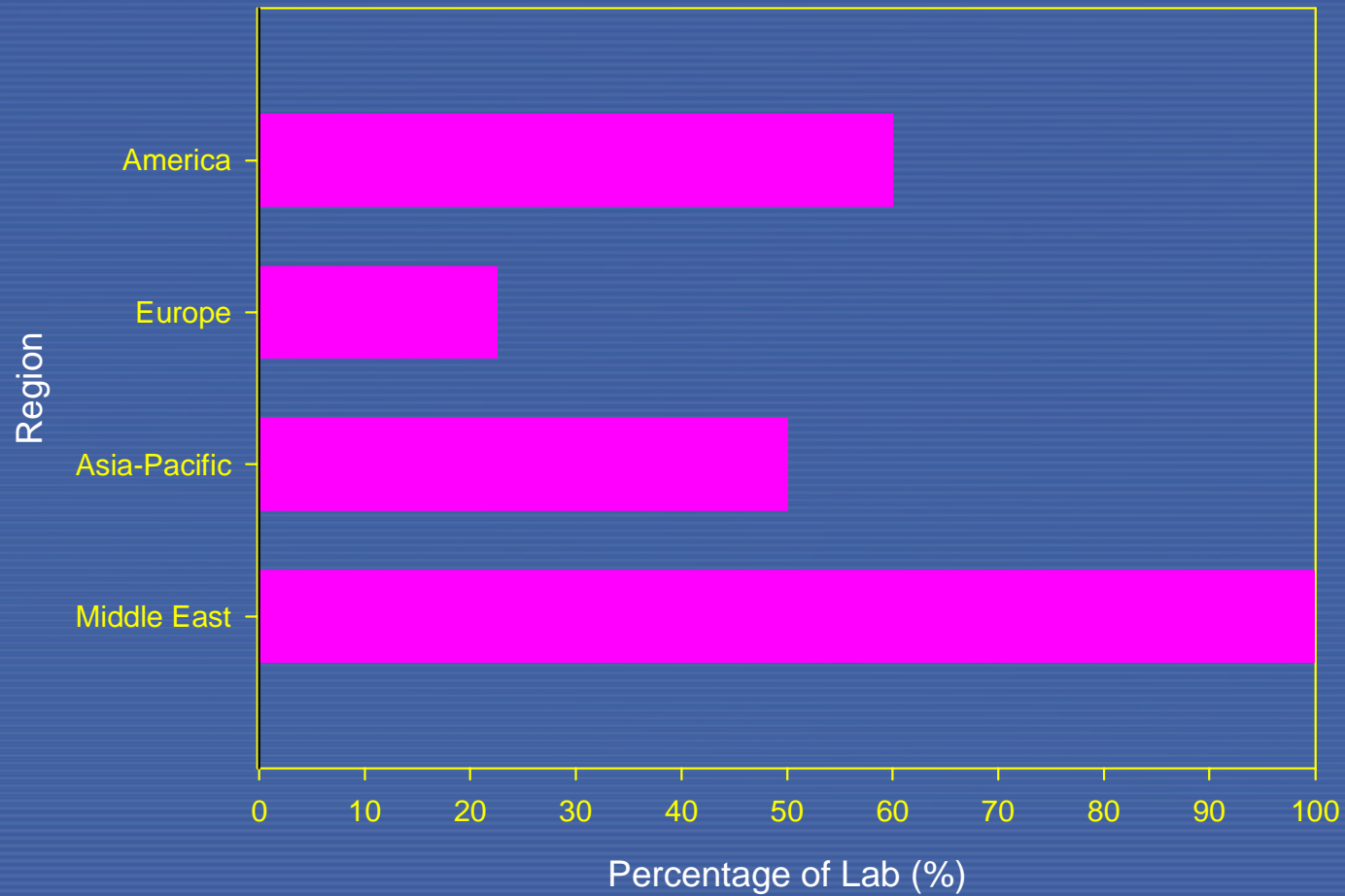
# Regional distribution of Labs accredited with ISO 17025 for gamma-spectrometry



# RM of IAEA purchased by ALMERA Member LABs in last 3 years

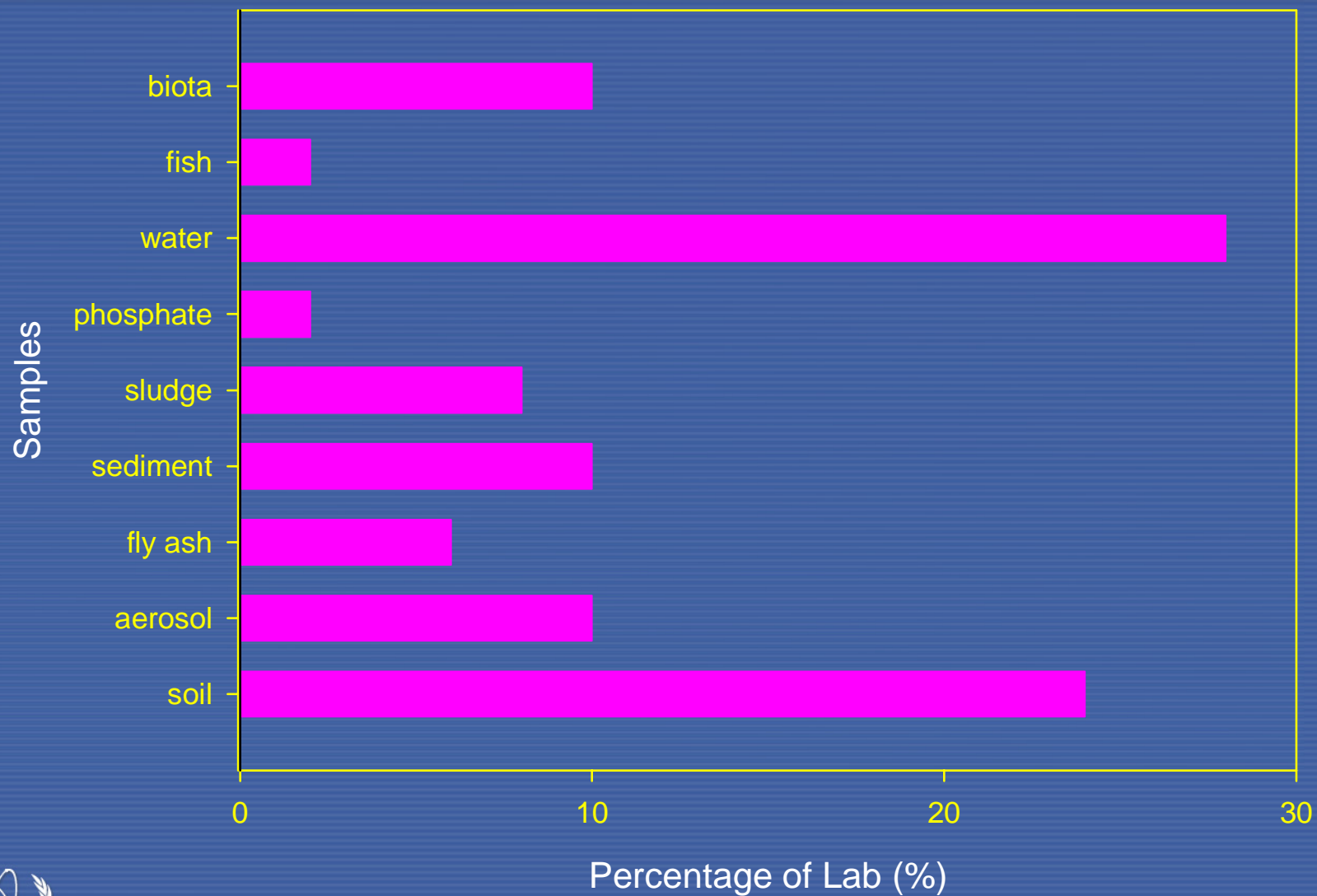


# Regional percentage of Lab with the project related to NORM

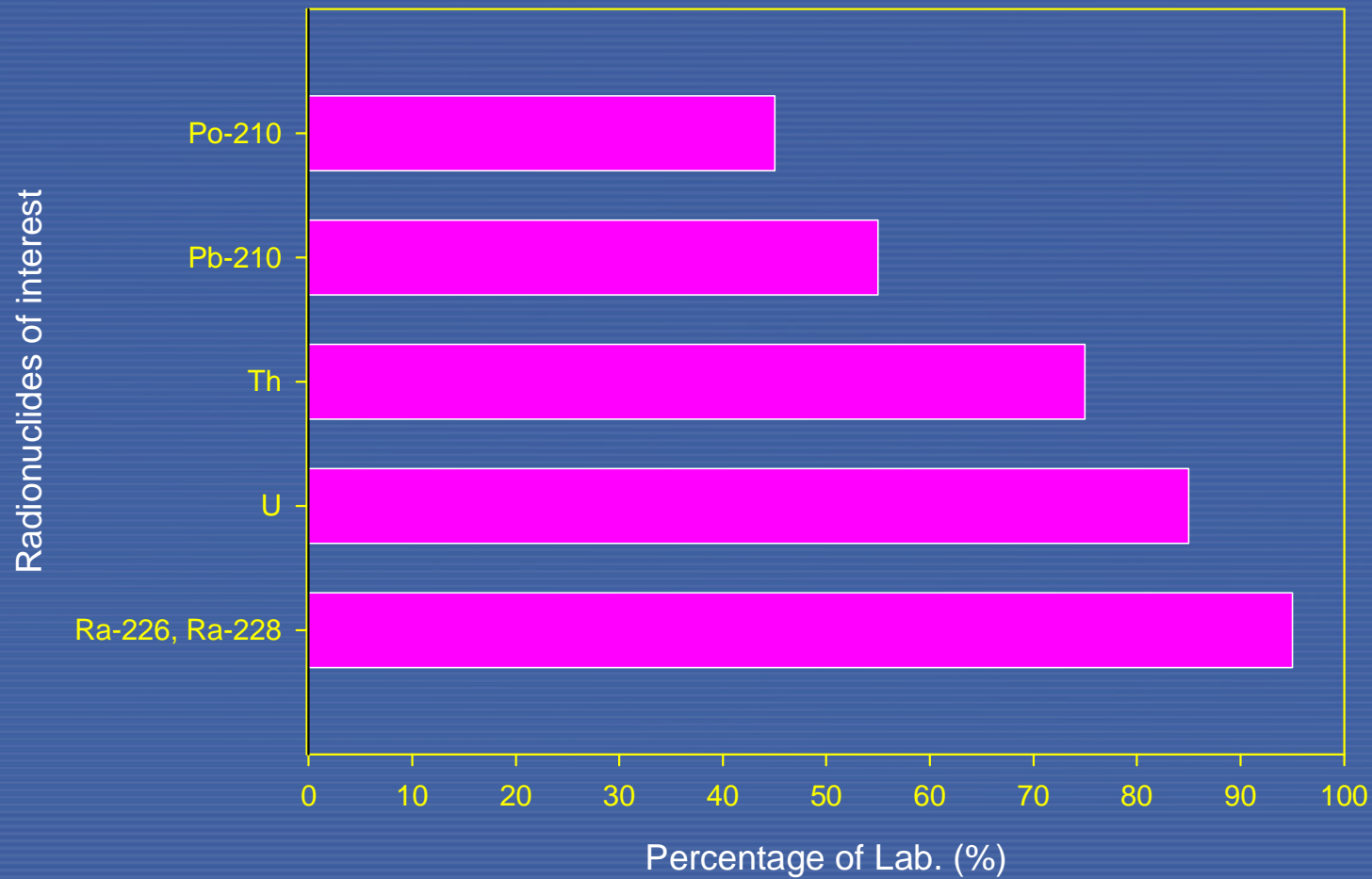




# Distribution percentage of samples analyzed regarding NORM



# Radionuclides in NORM



# Comments

## *PT and RM*

- In-Situ Gamma-spectrometry
- Ra-226, Ra-228, Pb-210 and gross alpha/beta activities in drinking water
- Air filter, milk and bioassay samples (tissue, blood, urine, etc.)
- Require more amount of PT sample
- Provide standards with PT samples
- PT samples for gamma and alpha/beta should be separated
- RM for air filter, milk and water for Ra-226 and Pb-210



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# Comments

## *Questionnaire for analysis cost and time*

- Reporting time and sample size
  - depend on activity level and uncertainty required
- Analysis cost
  - Detection limit and uncertainty required

# Conclusion

- Equipments
  - Gamma-spec ; 100%
  - LSC/Gas-pro ; ~ 80%
  - Alpha-spec ; ~ 70%
- 45% (27 labs) accredited in gamma-spectrometry
- Dominant sample matrix ; soil and water
- Dominant RM purchased ; soil and milk powder
- Requests for RM : air filter and bio-samples
- Request for PT : air filter, Ra-226, gross alpha/beta in DW
- Middle East, S. America and Asia-Pacific labs are interested in NORM



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Thank you for your attention



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