



Competency Framework for MedTech Regulators

A joint initiative of AHWP, APACMed, and Deloitte



Acknowledgments

We would like to give special thanks to MedTech regulatory agencies from **the 13 AHWP economies** for their participation in the self-assessment survey, the results of which provided the foundation to this competency framework. The economies include Chile, Chinese Taipei, Hong Kong SAR of China, Indonesia, Kingdom of Saudi Arabia, Malaysia, People's Republic of China, Philippines, Republic of Korea, Sultanate of Oman, Tanzania, Thailand, and Vietnam.

We would like to especially thank **the leadership of Mr. Ali M. Al-Dalaan, Chair of AHWP Technical Committee, Dr. Jeong-Rim Lee, Director of Korea Ministry of Food and Drug Safety (MFDS), and Mr. Alfred Kwek, AHWP Technical Committee Co-Chair (Industry).**

Finally, we are grateful to all APACMed member companies for their valuable participation in the industry survey, which provided great value in validation of the methodology of this study.

We trust that this paper will be valuable for regulators as they develop actionable plans to address the competency development challenges faced across APAC, and ultimately deliver high-quality services to all the stakeholders they collaborate with.

Agenda

- ❑ Introduction
- ❑ Key findings from survey
- ❑ MedTech Regulators' Competency Framework



Introduction

Rationale

Over the last decades, international organizations, government agencies, NGOs, academia, associations, and industry have come together to build a sustainable talent pipeline of regulatory professionals across both sectors.

However, the efficiency and effectiveness of these efforts have been questioned. Trainings have been deemed to be, at times, too infrequent or inconsistent.

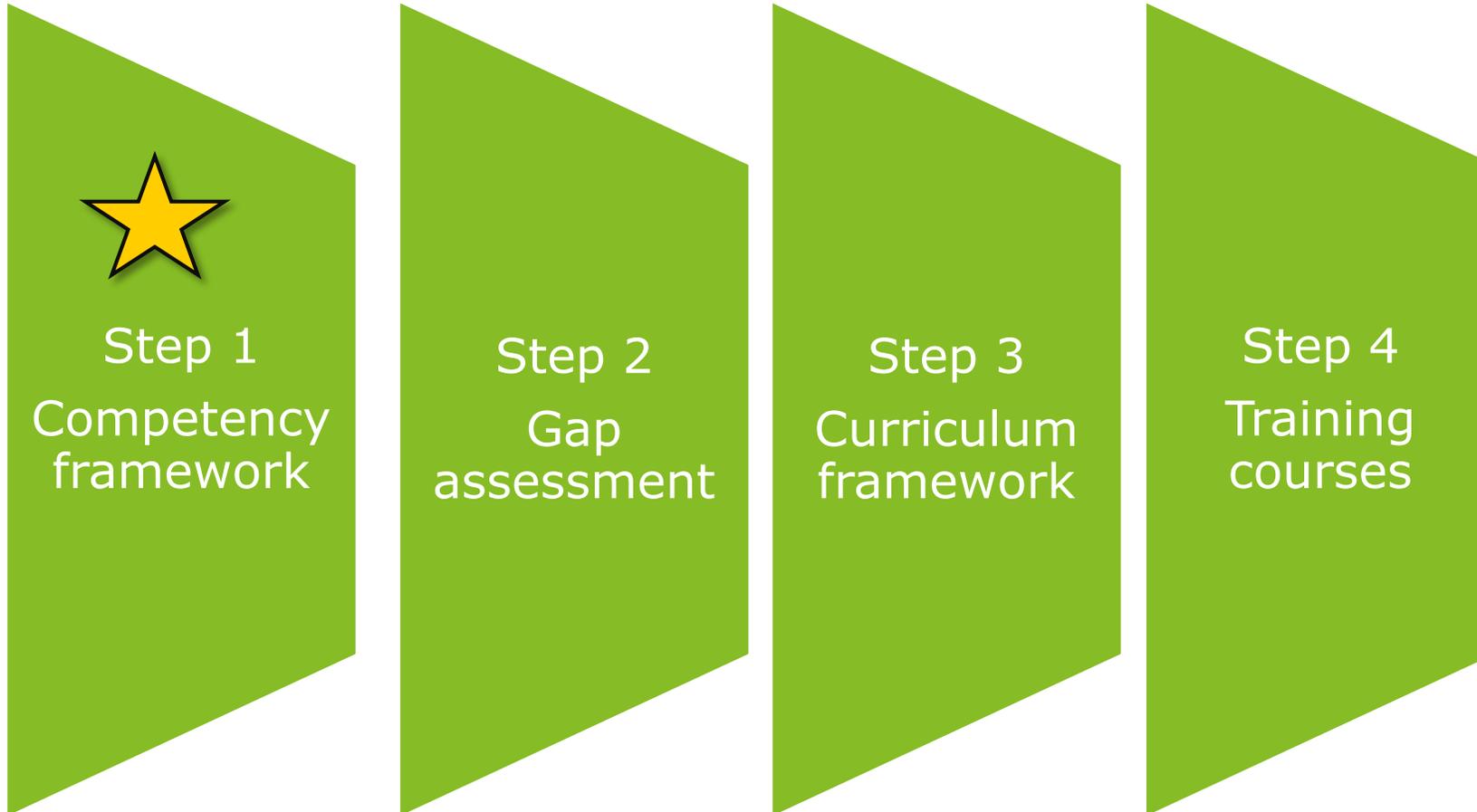
Hence, multi-stakeholder training initiatives, better-coordinated training resources, as well as the standardization of regulatory curricula are much needed.



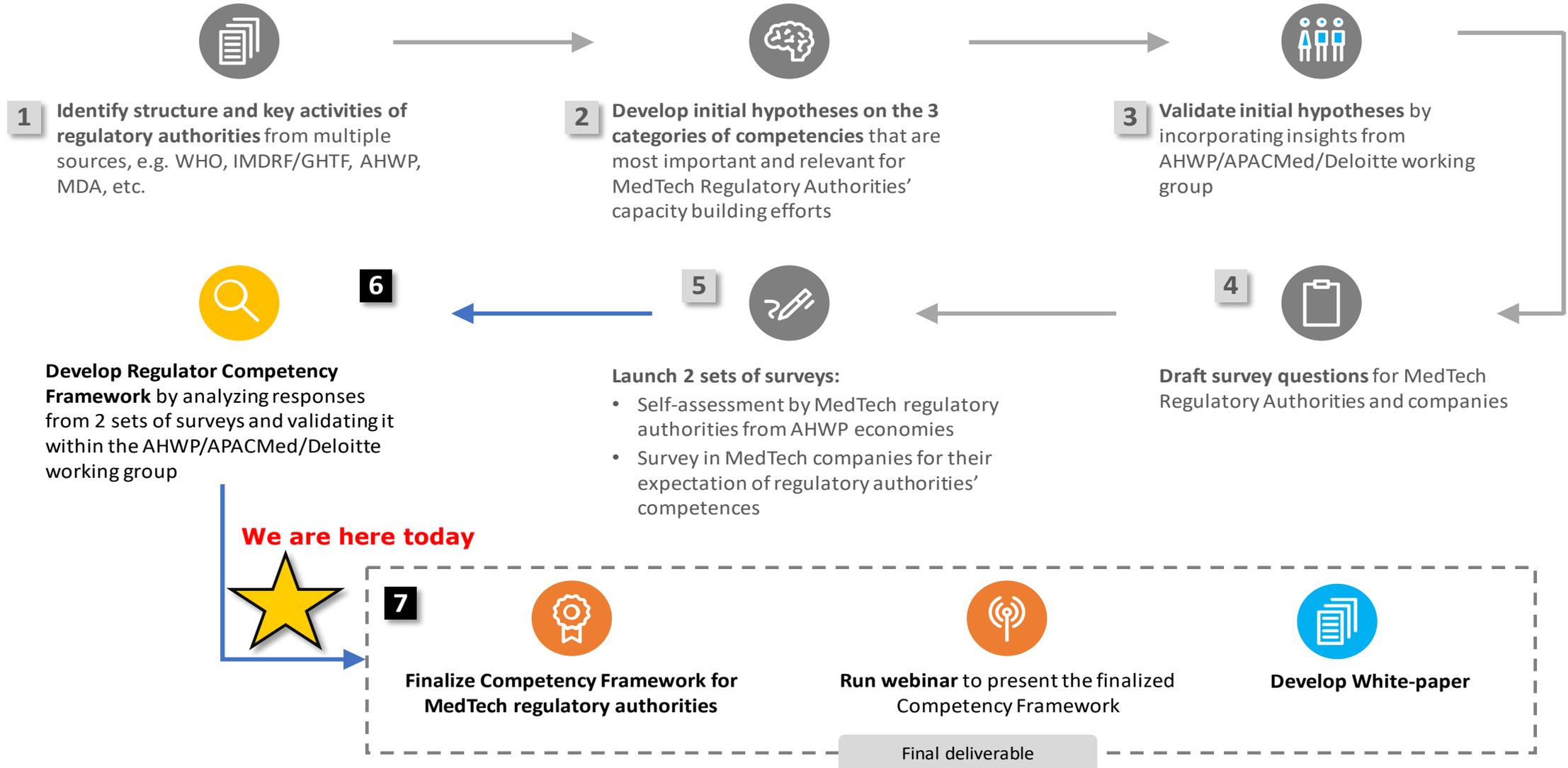
Develop a
Competency
Framework
for MedTech
Regulators

It takes 4 steps to design good trainings

Scope of this project



AHWP/APACMed/Deloitte joint study methodology



Secondary Research

Regulatory Model based on five economies of Global Harmonization Task Force (GHTF);

Asian Harmonisation Working Party (AHWP) Playbook for Implementation of Medical Device Regulatory Frameworks focusing on regulatory controls on importers and distributors;

World Health Organisation (WHO) Global Model Regulatory Framework for Medical Devices including in vitro diagnostic medical devices, which provides a segmentation of regulatory activities at basic level and expanded level;

WHO global benchmarking tool with 4 maturity levels of regulatory functions;

Medical device regulatory competency program in Malaysia.

Primary Research

Regulator's self assessment

To identify the **scope of regulatory activities** in AHWP member economies;

To identify **basic core competencies universal** to regulators in different economies as well as additional essential competencies (with multiple modules which can be selected according to the specific needs of regulators in different economies).

Industry Survey

To assess their current **levels of satisfaction with the overall levels of knowledge and service of MedTech Regulators**;

To assess their **expectations of regulators' competencies** and skill set for validation purpose.

Two surveys were launched in July and August of 2018 which formed the basis of this study

**We reached out to MedTech regulatory agencies of 30
AHWP Member Economies...**

What?

Uncover common
Regulator internal
priorities, challenges
and focus areas for
competency building

Self Assessment



Who?

AHWP Regulators of
member economies



**...and APACMed member companies operating in
the identified AHWP Member economies**

What?

Explore MedTech
company stakeholder
expectation of AHWP
Regulators

Stakeholder Expectation



Who?

Cross-functional
stakeholders from
MedTech industry

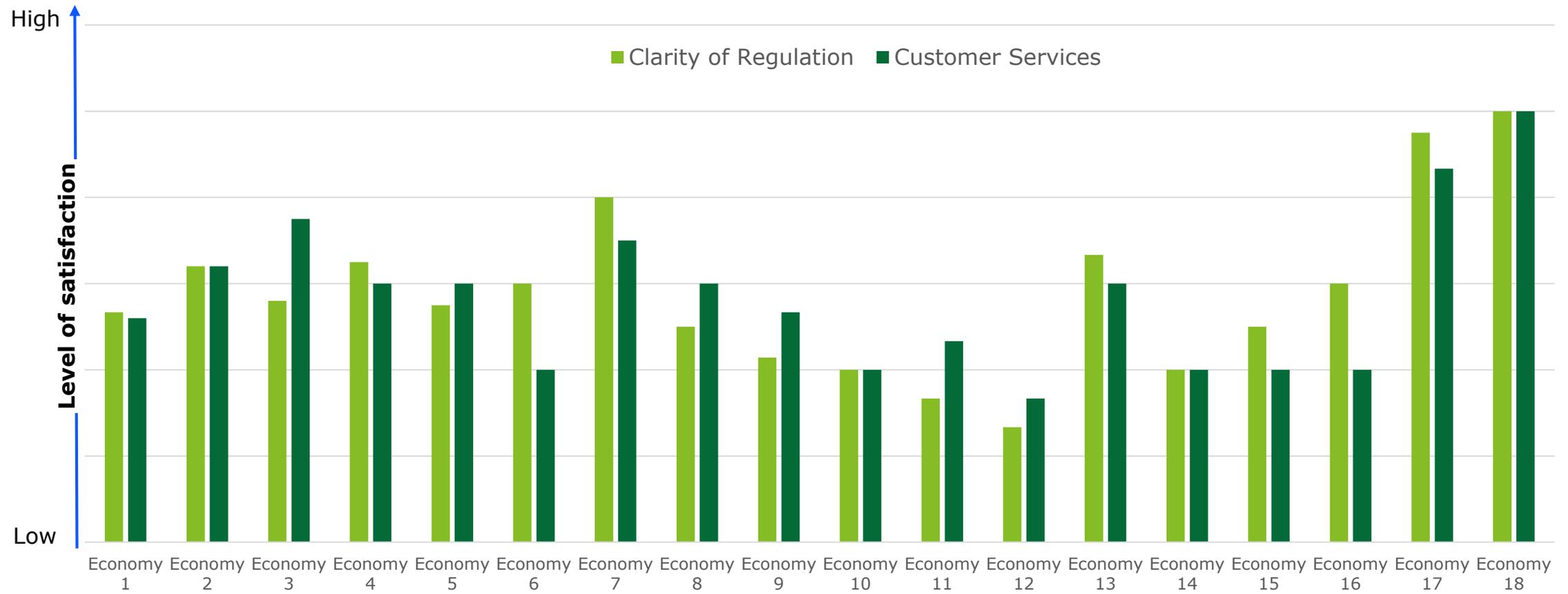
We have received inputs from **18 MedTech companies and 13 regulatory agencies**; subsequent slides describe the key findings from these surveys and a proposed competency framework for MedTech regulatory agencies in AHWP member economies



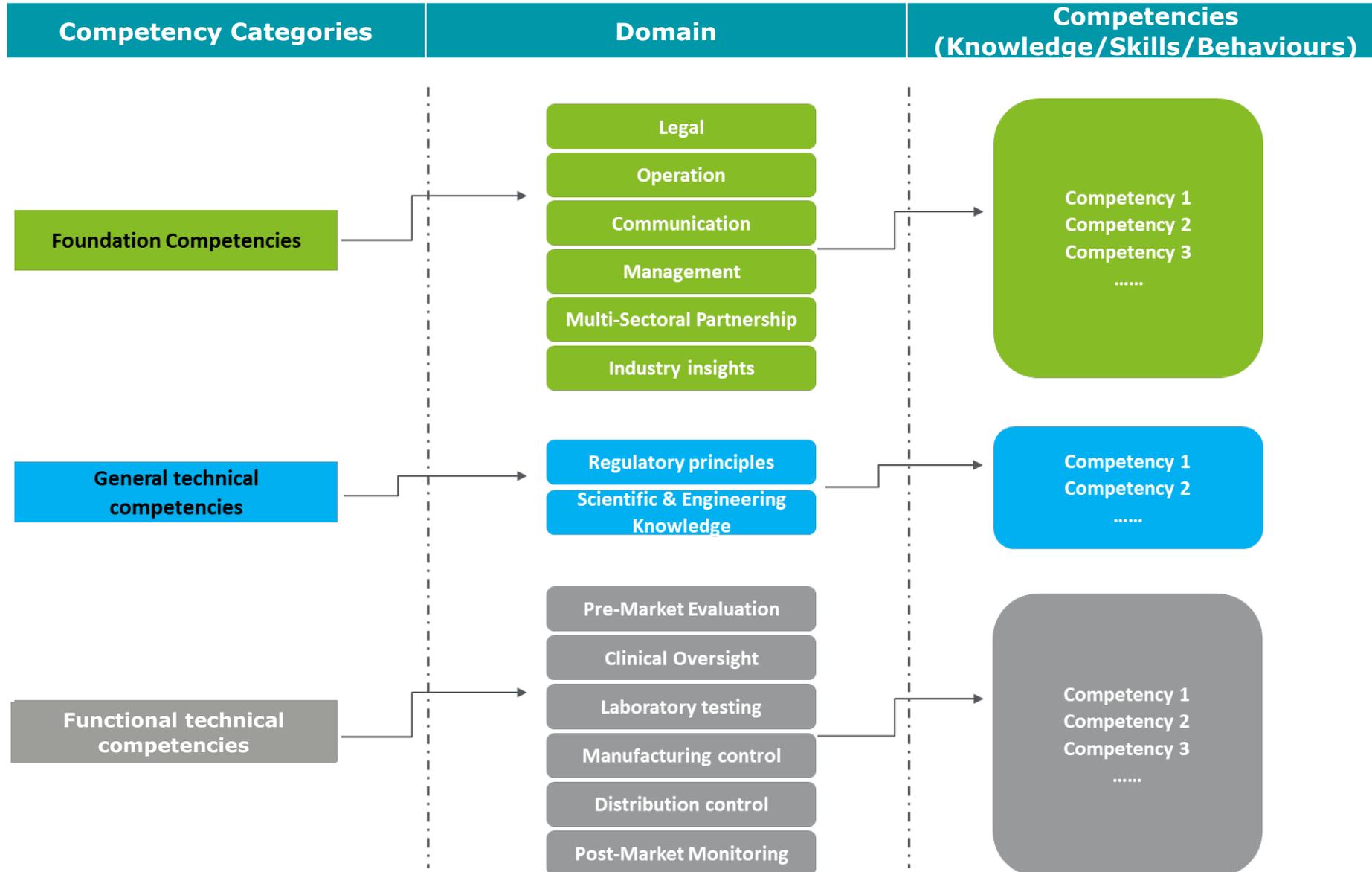
Key findings from survey

As reported by MedTech companies, satisfaction on customer service has a wide spread but tends to be closely co-related to clarity of regulations in member economies.

MedTech companies gives high value to clarity of regulations and it is one of drivers for improving customer satisfaction



Structure of the competency framework



Subsequent section illustrates key findings from the self assessment survey of regulatory agencies. These findings have been used to recommend a **competency framework for regulators to conduct gap assessment and develop a training curriculum**

The study acknowledges that constraints and needs vary across AHWP member economies. Hence recommended priority can be used as **a guide and further tweaked to suit individual member economy needs**

Breakdown of competencies & ratings of importance

97 competencies were grouped into three dimensions or categories:

38 **Foundational Competencies** (applicable to all staff)

20 **General Technical Competencies** (applicable to all technical staff)

39 **Functional Technical Competencies** (applicable to staff in a specific regulatory function out of the entire the product lifecycle)

The survey respondents were asked to rate the importance of each of these competencies from one (1) to five (5), with five (5) being the most critical. Within each dimension, based on the compiled and averaged scores, competencies were further divided into:

Primary focus (highlighted in dark grey) (with score greater than 4.4/5)

Secondary focus (highlighted in light green) (with score between 4.1/5 to 4.4/5)

Tertiary focus (highlighted in white) (with score less than to 4.1/5)

“Foundational Competencies”

Domain Deep Dive:

Legal (L) domain: most regulators agree that knowledge of **local laws, regulation, as well as local technical documents and standards are more important than regulations in other countries.**

Operation (O) domain: regulators are more likely to invest in trainings on **codes of conduct, technical report writing, documentation, as opposed to IT or customer services skills.**

Communication (C) domain: interpersonal skills and general communications skills are rated as more important than media strategy and public education.

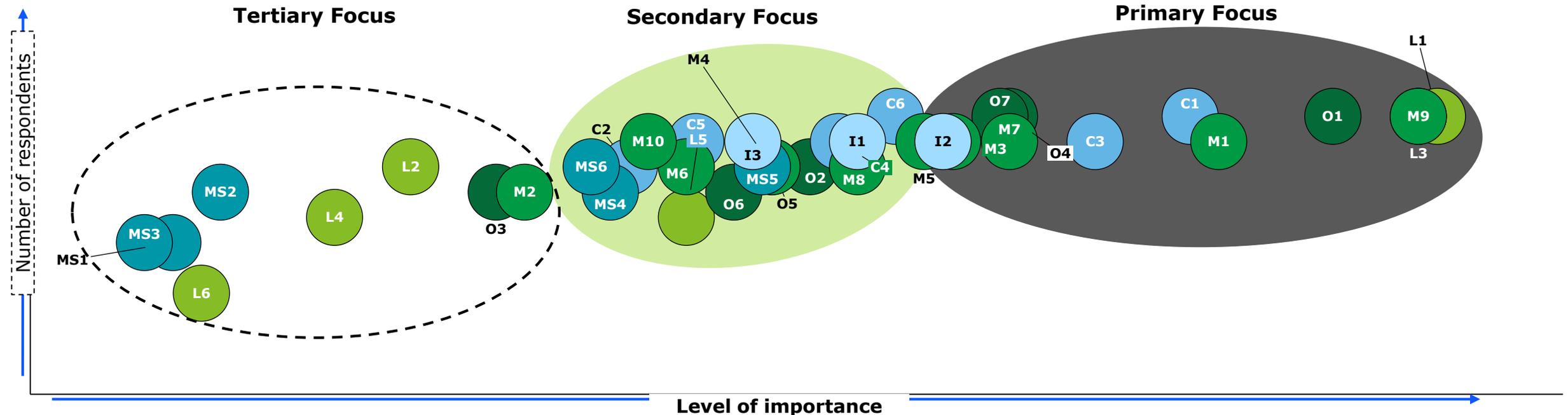
Management (M) domain: most regulators consider quality management, risk management, training skills and Good Regulatory Practice (GRP) to be the most important competencies, while project management knowledge is rated as less important than the rest of them.

Multisector Partnership (MS) domain: none of the competencies in this domain are rated as critical, and international initiatives are only rated as medium critical, which is not consistent with findings from other projects.

Industry Insights (I) domain: regulators agree it is very important to enhance their knowledge of emerging technologies and innovative products.

1 “Foundational competency” covers 6 domains

All foundational competencies are considered as important across all economies, three distinct groups of skill-sets emerge across level of importance defining the focus areas



Legal (L)	
1	Legal documents (local)
2	Legal documents (international)
3	Technical documents (local)
4	Technical documents (international)
5	Legislative process
6	Legal writing

Operation (O)	
1	Code of conduct
2	Critical Thinking & Problem Solving
3	Budget Planning & Management
4	Documentation & Filing
5	Customer Service
6	IT Skills
7	Technical Report Writing

Communication (C)	
1	Effective Communication
2	Public Speaking
3	Interpersonal Skills
4	Negotiation
5	Information Dissemination & Media Strategy
6	Public Education

Management (M)	
1	Quality Mgmt. system
2	Project Mgmt.
3	Risk Mgmt.
4	Crisis Mgmt.
5	People Mgmt.
6	Mentoring & Coaching
7	Training
8	Leadership
9	Good Regulatory Practice
10	Policy Analysis

Multisector partnership (MS)	
1	Foreign Languages & Culture
2	Diplomatic and Foreign Affairs Policy
3	Healthcare Ecosystem
4	Stakeholder Engagement
5	International Initiatives and networks
6	Public Health

Industry Insights (I)	
1	Local industry landscape
2	Emerging technologies and products
3	International industry landscape

“General Technical Competencies”

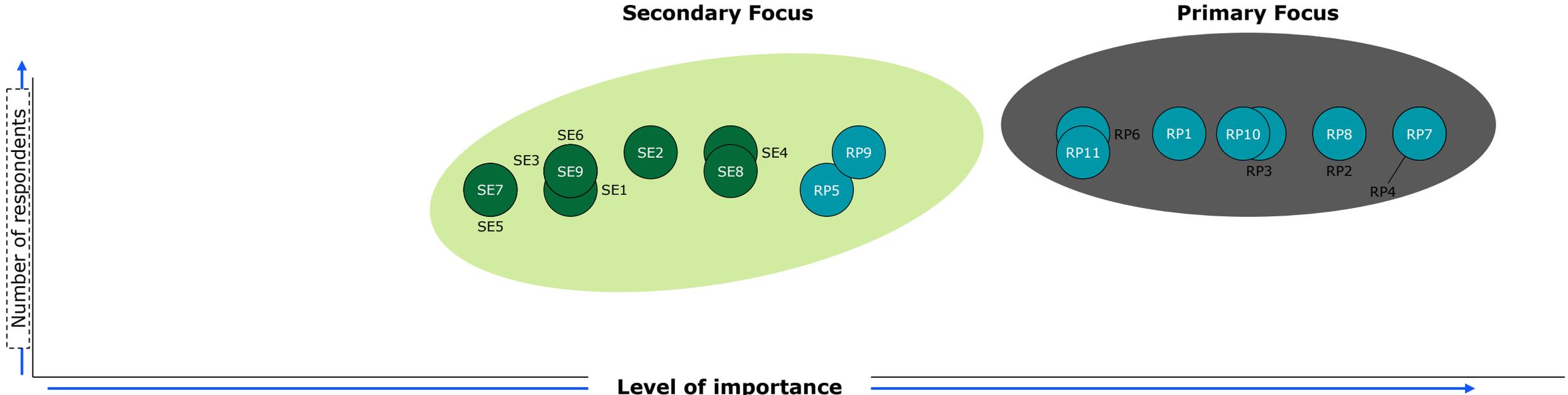
Domain Deep Dive:

Scientific and Engineering Principles (SE) Regulatory Principles (RP)

All competencies in this dimension have averaged scores over 4.1/5 (either Primary Focus or Secondary Focus). Nine (9) out of twenty (20) General Technical Competencies are rated as most critical, or **Primary Focus**, and all of them in the Domain of Regulatory Principles (RP). This shows regulators are, in general, more inclined to prioritize trainings for competencies in regulatory principals such as Risk Classification, Combination & Borderline Products, Unique Device Identifier (UDI), Standards, Essential Principles of Safety & Performance, etc.

While Scientific & Engineering Principles are obviously deemed important (no score was below 4.1/5), however, these could be trained through standard curricula outside regulatory agencies, such as universities, professional association, or training agencies. This may also explain the reason why **NONE** of the competencies within the domain of Scientific and Engineering Principles was rated as most critical (with scores above 4.4/5), or Primary Focus.

2 “General technical competency” covers regulatory principles and scientific/engineering knowledge
 All general technical competencies are considered important, mainly two distinct groups of Skill-sets emerge across level of importance defining the focus priorities



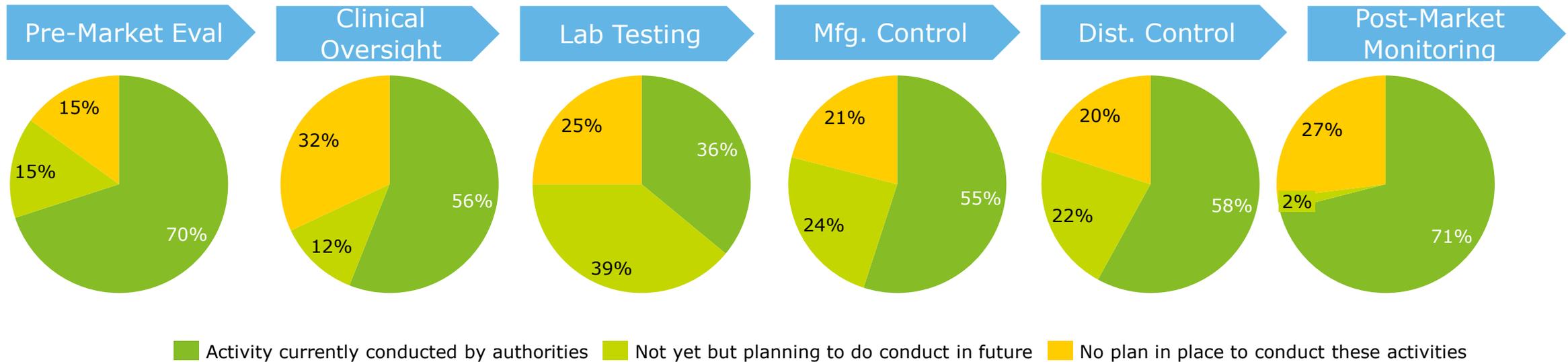
Scientific & Eng. Principles (SE)	
1	Human Anatomy and Physiology
2	Biological Science
3	Biochemistry
4	Biomaterials
5	Nanomaterials
6	Biomechanics
7	Bioelectronics
8	Radiation and Nuclear Medicine
9	Digital Technology (mobile health, telemedicine, AI, etc.)

Regulatory Principles (RP)	
1	Differences -Pharmaceuticals, General MDs & IVDs
2	Combination and Borderline Products
3	Risk Classification
4	Essential Principles of Safety & Performance
5	Device Nomenclature Systems (GMDN/UMDNS)
6	Device Labelling & Unique Device Identifier (UDI)
7	Conformity Assessment Concepts and Principles
8	Post-marketing Surveillance System
9	Supply chain integrity
10	Local Standards
11	International Standards

Different regulatory activities throughout the medical device product lifecycle are currently undertaken across markets.

The survey identified key regulatory activities that need to be undertaken across a Medical Device’s Lifecycle; Initial assessment suggests a variance in regulatory activities currently undertaken across AHWP Member Economies

- Overall **75%** of the member economies are conducting or planning to conduct regulatory activities across all the product life cycle
- Maturity of providing a full breath of services across the product life cycles varies a lot from economy to economy



Country percentages

Lab testing activities have **limited coverage across** the surveyed member economies

Post market and Pre market evaluation activities have the **highest coverage across** all the functional technical subgroup competencies

“Functional technical competencies”

Domain Deep Dive:

1-Pre-market evaluation, 2-Clinical oversight, 3-Laboratory testing, 4-Manufacturing control, 5-Distribution control, 6-Post-market Monitoring

In the survey, for each of the 6 Domains, regulators were asked to identify:

- Regulatory activities which **are currently conducted** by the regulatory agency;
- Regulatory activities which **are not yet conducted** by the agency but will be in the near future;
- Regulatory activities which **are not conducted** by the agency, and where there **is no plan** to do so.

About 70% of the surveyed economies are currently implementing Pre-Market Control and Post-Market Monitoring, and an additional 15% are planning to implement Pre-Market Monitoring.

About half of the surveyed economies have regulatory controls over clinical evaluation, manufacturing and distribution. An additional 20% are planning to invest in regulating manufacturing and distribution, while an additional 12% are planning to regulate clinical evaluation.

Only 36% of participating economies are currently conducting regulatory lab testing, but another 39% (the biggest increase across all functions) are planning to invest in this regulatory activity and thus might be keener in enhancing their capacities in this field.

Fifteen (15) out of thirty-nine (39) Functional Technical Competencies were rated as most critical, or Primary Focus.

For example, **Pre-Market Evaluation (PM)**, most regulators considered knowledge of **grouping, submission dossier format & content, change management, and general safety & performance evaluation** to be the most important.

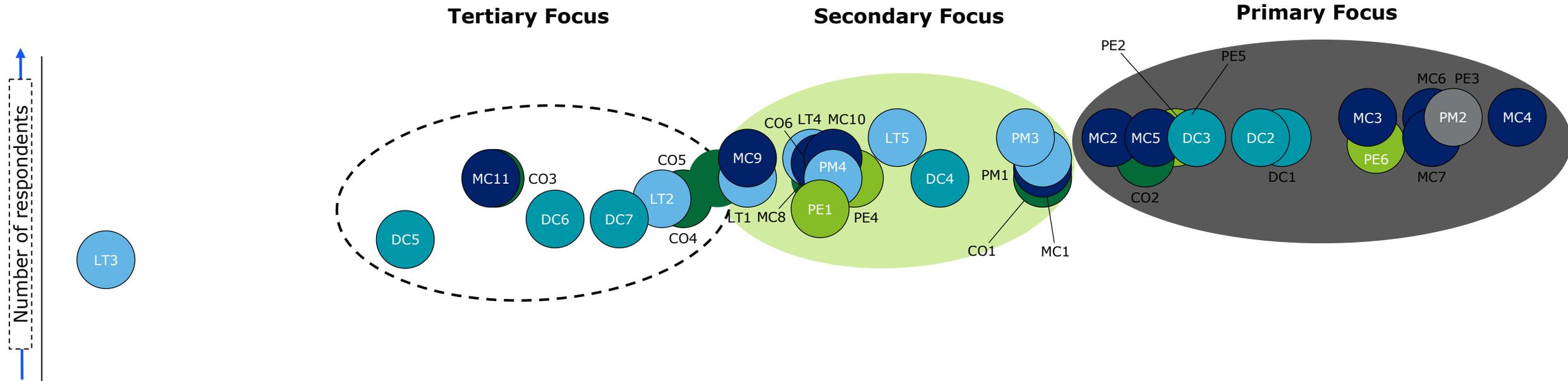
Similar with Pre-Market Evaluation, all competencies in the domain of Post-Market Monitoring were also rated with averaged scores over 4.1/5.

The domain of Manufacturing control (MC) has the largest number of competencies that were rated as Primary Focus, including both **local and international GMP requirements, Quality System auditing, validation and verification methods, risk management methods, etc.**

None of the competencies under Laboratory testing (LT) was rated as the most critical or Primary Focus based on the regulators' self-assessment.

3 “Functional Technical competency” cover skills and knowledge required across the product lifecycle

Skills required to undertake regulatory activities across the product lifecycle have been ranked across three distinct groups based on levels of importance by member economies



Level of importance

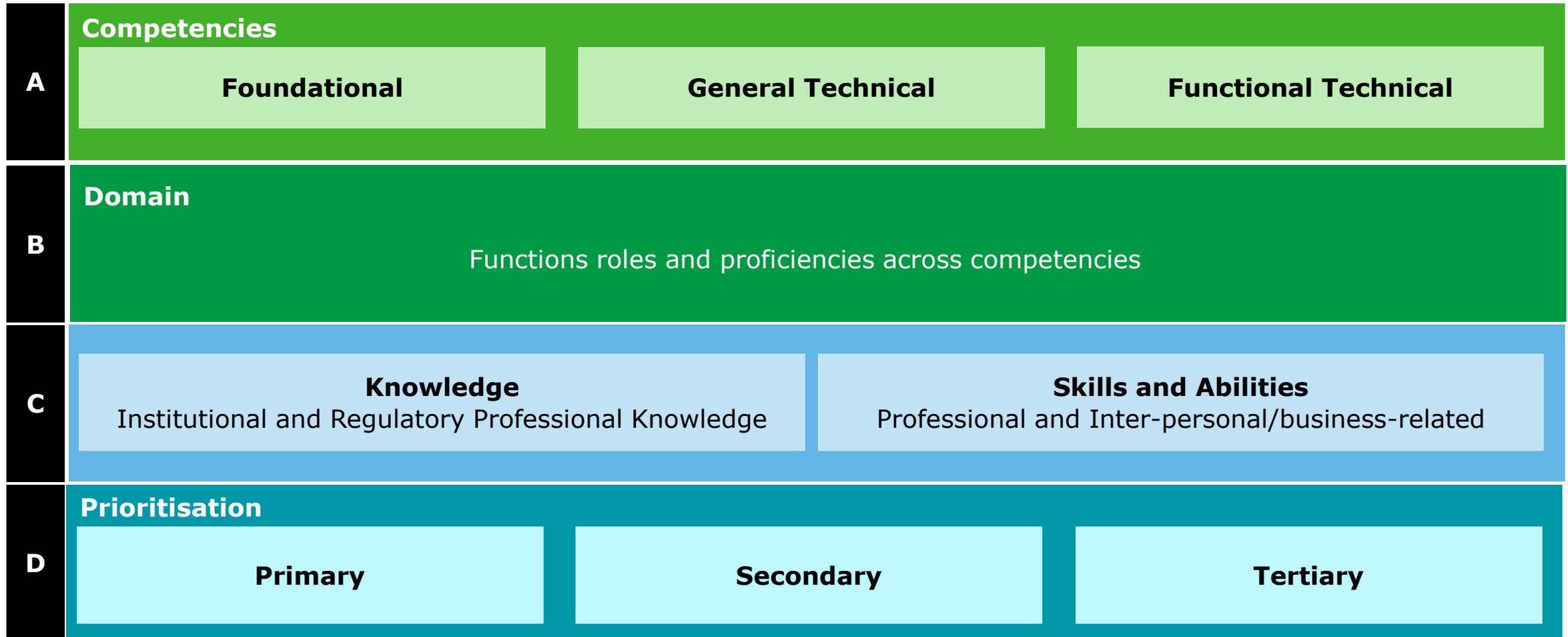
Pre-Market (PM)	Clinical Oversight (CO)	Laboratory testing (LT)	Manufacturing control (MC)	Distribution Control (DC)	Post Market (PM)
1 International MD Rqmts.	1 Declaration of Helsinki & Nuremberg Code	1 Good Laboratory Practice	1 Intl. MD Rqmts. In Quality system (QS)	1 Good Distribution Practice	Intl. MD reqmts. in
2 Device Registration Unit / Grouping Principles	2 ISO 14155 Clinical Investigation of MD for Human Subj.	2 Laboratory Quality Management System	2 GMP (loc.)	2 Quality System auditing skills	1 Post-marketing Surveillance
3 Submission Dossier Format and Content	3 Good Clinical Practice (ICH)	3 Occupational Health and Safety Standards	3 GMP(Intl.)	3 Risk Management principles	2 Risk Management principles
4 Declaration of Conformity Rqmts.	4 Good Clinical Practice (Local)	4 Relevant local test standards	4 QS auditing skills	4 Import/export regulations (loc.)	3 Advertising & Promotional Regulation
5 Device Change Management	5 Clinical Evaluation (Evidence Based)	5 Relevant international test standards	5 Loc./Intl. standards	5 Import/export regulations (Intl.)	4 Supervision on reprocessing of single-use medical devices
6 General Device Safety & Performance	6 Statistics		6 Design validation / verification methods	6 Disposal of MDs	
			7 Risk Mgmt. Principles	7 Environmental considerations	
			8 Mfg.Process & Tech.		
			9 Calibration/Metrology		
			10 Cleanroom process		
			11 Refurbishment of MDs		



MedTech Regulator Competency Framework

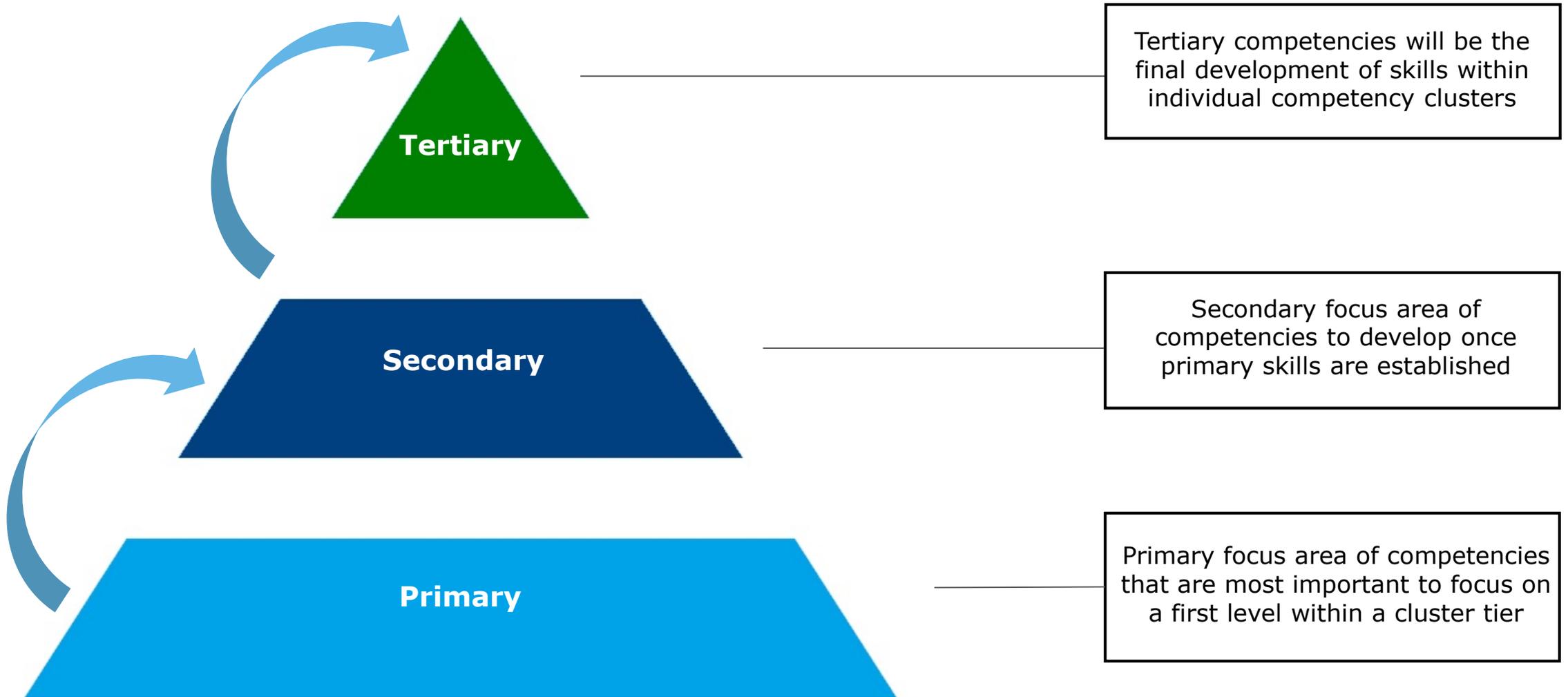
MedTech Competency High-Level Framework

Competencies and associated knowledge, skills and abilities can be developed and supported through a structured training curriculum – the following competency framework with recommended prioritization will assist in conducting gap assessment and developing a training curriculum



Prioritization: Progressive focus areas for competency development

Feedback from regulatory agencies indicate that some skills-sets are more important than others - the framework provides regulators with a clear guidelines on which skills need to be developed first and which need to be developed after



How to Use the Framework

Step 1: Select competency category. It is recommended MedTech regulators and their trainings partners review this competency framework category by category, starting from Foundational Competencies (Figure 9), to General Technical Competencies (Figure 10), then to Functional Technical Competencies (Figure 11).

Step 2: Select level of focus. Prioritize trainings based on the level of focus, starting from “Primary” competencies, followed by “Secondary”, finally to “Tertiary” competencies, resources permitting.

Step 3: Identify the curriculum framework based on competency framework and gap assessment. It is recommended to identify the competencies that are relevant and critical to the trainees in the regulatory agency and to formulate the curriculum framework based on gap assessment and both short-term and long-term needs.

Step 4: Develop training programs. It is recommended for MedTech regulators to involve multiple stakeholders from both public and private sectors as early as possible in identifying the needs and prioritizing the trainings resources. Subject experts should be invited to advise on developing trainings programs, delivering trainings as well as evaluating the effectiveness of trainings.

Recommended prioritization for: **Foundational Competencies**

Figure 9. Prioritization of Foundational Competencies.

Priority	Domain	Knowledge, Skills and Abilities
Primary	Legal	<ul style="list-style-type: none"> • Legal Documents (Local) • Technical Documents (Local)
	Management	<ul style="list-style-type: none"> • Good Regulatory Practice • Quality Management System for Regulatory Authorities • Risk Management • Training
	Operation	<ul style="list-style-type: none"> • Code of Conduct • Documentation & Filing • Technical Report Writing
	Communication	<ul style="list-style-type: none"> • Effective Communication (verbal and written) • Interpersonal Skills
	Industry Insights	<ul style="list-style-type: none"> • Emerging Technologies and Products
Secondary	Management	<ul style="list-style-type: none"> • People Management • Leadership • Crisis Management • Mentoring & Coaching • Policy Analysis & Strategies
	Communication	<ul style="list-style-type: none"> • Public Education • Negotiation • Public Speaking • Information Dissemination & Media Strategy
	Industry Insights	<ul style="list-style-type: none"> • Local Industry Landscape • International Industry Landscape
	Operation	<ul style="list-style-type: none"> • Critical Thinking & Problem Solving • Customer Service • IT Skills
	Multi-Sectoral Partnership	<ul style="list-style-type: none"> • International Initiatives and networks • Stakeholder Engagement • Public Health
	Legal	<ul style="list-style-type: none"> • Legislative process

Recommended prioritization for: **General Technical Competencies**

Priority	Domain	Knowledge, Skills and Abilities
Tertiary	Management	<ul style="list-style-type: none"> • Project Management
	Operation	<ul style="list-style-type: none"> • Budget Planning & Management
	Legal	<ul style="list-style-type: none"> • Legal Documents (International) • Technical Documents (International) • Legal Writing
	Multi-Sectoral Partnership	<ul style="list-style-type: none"> • Diplomatic and Foreign Affairs Policy • Foreign Languages & Culture • Healthcare Ecosystem

Figure 10. Prioritization of General Technical Competencies.

Priority	Domain	Knowledge, Skills and Abilities
Primary	Regulatory Principles	<ul style="list-style-type: none"> • Essential Principles of Safety & Performance • Conformity Assessment Concepts and Principles • Combination and Borderline Products • Post-marketing Surveillance System • Risk Classification • Local Standards • Differences between Pharmaceuticals, General MDs and IVDs • Device Labelling & Unique Device Identifier (UDI) • International Standards
		<ul style="list-style-type: none"> • Supply Chain Integrity • Device Nomenclature Systems (GMDN/UMDNS)
		<ul style="list-style-type: none"> • Biomaterials • Radiation and Nuclear Medicine
Secondary	Scientific Engineering Principles	<ul style="list-style-type: none"> • Biological Science • Human Anatomy and Physiology • Biochemistry • Biomechanics • Digital Technology (mobile health, telemedicine, AI, etc.) • Nanomaterials • Bioelectronics

Recommended prioritization for: **Functional Technical Competencies**

Figure 11. Prioritization of General Technical Competencies.

Priority	Domain	Knowledge, Skills and Abilities
Primary	Manufacturing Control	<ul style="list-style-type: none"> Quality System Auditing Skills Design Validation and/or Verification Methods Risk Management Principles Good Manufacturing Practice (International) Relevant Local and International Standards Good Manufacturing Practice (Local)
	Premarket Evaluation	<ul style="list-style-type: none"> Submission Dossier Format and Content General Device Safety & Performance Device Registration Unit/Grouping Principles Device Change Management
	Post-Market Monitoring	<ul style="list-style-type: none"> Risk Management Principles
	Distribution Control	<ul style="list-style-type: none"> Good Distribution Practice Quality System Auditing Skills Risk Management Principles
	Clinical Oversight	<ul style="list-style-type: none"> ISO 14155 Clinical Investigation of MD for Human Subjects
Secondary	Manufacturing Control	<ul style="list-style-type: none"> Manufacturing Process & Technology International Medical Device Requirements in Quality System Cleanroom Processes Calibration and Metrology
	Clinical Oversight	<ul style="list-style-type: none"> Declaration of Helsinki & Nuremberg Code Statistics
	Post-Market Monitoring	<ul style="list-style-type: none"> International Medical Device Requirements in Post-marketing Surveillance Advertising and Promotional Regulation Supervision on Reprocessing of Single-use Medical Devices (SUMDs)
	Distribution Control	<ul style="list-style-type: none"> Import/Export Regulations (including customs requirements - Local)
	Laboratory Testing	<ul style="list-style-type: none"> Relevant International Test Standards Relevant Local Test Standards Good Laboratory Practice
	Premarket Evaluation	<ul style="list-style-type: none"> Declaration of Conformity Requirements International Medical Device Requirements in Premarket Evaluation
Tertiary	Manufacturing Control	<ul style="list-style-type: none"> Refurbishment or Reprocessing of Medical Devices
	Laboratory Testing	<ul style="list-style-type: none"> Occupational Health and Safety Standards Laboratory Quality Management System
	Clinical Oversight	<ul style="list-style-type: none"> Clinical Evaluation (Evidence Based Medicine) Good Clinical Practice (Local) Good Clinical Practice (ICH)
	Distribution Control	<ul style="list-style-type: none"> Environmental Considerations Disposal of Medical Devices Import/Export Regulations (including customs requirements - International)

Validation of recommended competency prioritization by MedTech Companies (general functional skills¹ only)

MedTech companies rated the skills on level of importance and the results are **80% correlated** with the responses from regulators

MedTech company responses for **Pre-market evaluation, Manufacturing control and Post-marketing** skills sets (on level of importance and criticality) are **100% consistent and co-related** with regulators response

There is **less than 20% variation** between industry practitioners and regulators responses (on level of importance and criticality) for **Clinical oversights, Distribution control and Lab testing** skill sets

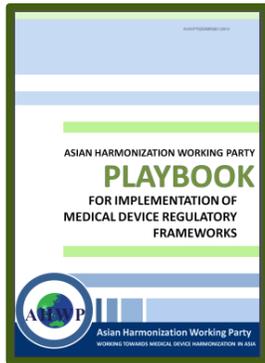
Overall, the proposed framework and prioritisation based on regulators self assessment is 80% co-related with industry practitioner responses

¹ Only 100% completed responses from Industry practitioner is considered for this variance analysis

Enhancing Capacity for Regulatory Agencies and Industries

AHWP Capacity Building Journey

2014 - 2017



2018 - 2019

- *White Paper Competency Framework for Medical Technology Regulators - Webinar*



Competency Framework for Medical Technology Regulators



สำนักงานคณะกรรมการอาหารและยา
Food and Drug Administration

Thailand in-country regulator training – 35 participants

2020 onwards

- 1 Competency Handbook
- 2 Curriculum
- 3 Training certification

References

- **WHO global benchmarking tool (2018)** http://www.who.int/medicines/regulation/benchmarking_tool/en/

Note 1: Comprehensive categories of indicators with sub-indicators and assigned with 4 different maturity levels

Note 2: For regulatory agency competency rather than regulatory individual competency; more for pharmaceuticals rather than medical devices (WHO has a tool for medical devices under development)

- **AHWP Playbook for Implementation of MD Reg Framework (2014)**

Note 1: A graduated set of controls – from the most basic to the more advanced – proportionate to device risks and across the medical device life cycle.

Note 2: Focus on regulatory controls of importers and distributors, rather than on those economies which also develop and manufacture devices.

- **GHTF ad hoc regulatory model (2011)**

Note 1: Progressive Regulatory Framework from basic level, to medium level, to highest level

Note 2: Based on GHTF members (Australia, Canada, EU, Japan, and USA), representing only developed economies

- **WHO Global Model Regulatory Framework for Medical Devices Including in Vitro Diagnostic Medical Devices (2017)**

Note 1: Solid works done by GHTF, AHWP, IMDRF, and WHO

Note 2: Two levels of breakdowns: basic-level vs. expanded level

- **Medical device regulatory competency program by Malaysia (MDA)**

Note 1: Both layout of competencies and curriculum

Note 2: Specific to Malaysia legal framework

THANK YOU!



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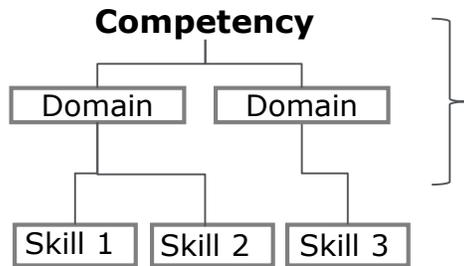
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Self-assessment survey for Regulators was to identify scope of regulatory activities and competencies required for the staff



Definition: Behaviours that demonstrate an ability to perform the job requirement competently

Definition: Skills, knowledge and abilities, when incorporated demonstrate an on-the-job behaviour

Three building blocks have been used to identify competencies for the Regulatory Assessment Survey

1

Foundational competencies

Applicable for all staff

Domains:

- Legal
- Operation
- Communication
- Management
- Multi-sectoral engagement
- Industry insights

2

General Technical competencies

Applicable for technical staff

Domains:

- Regulatory Principles
- Scientific and engineering knowledge

3

Functional Technical competencies

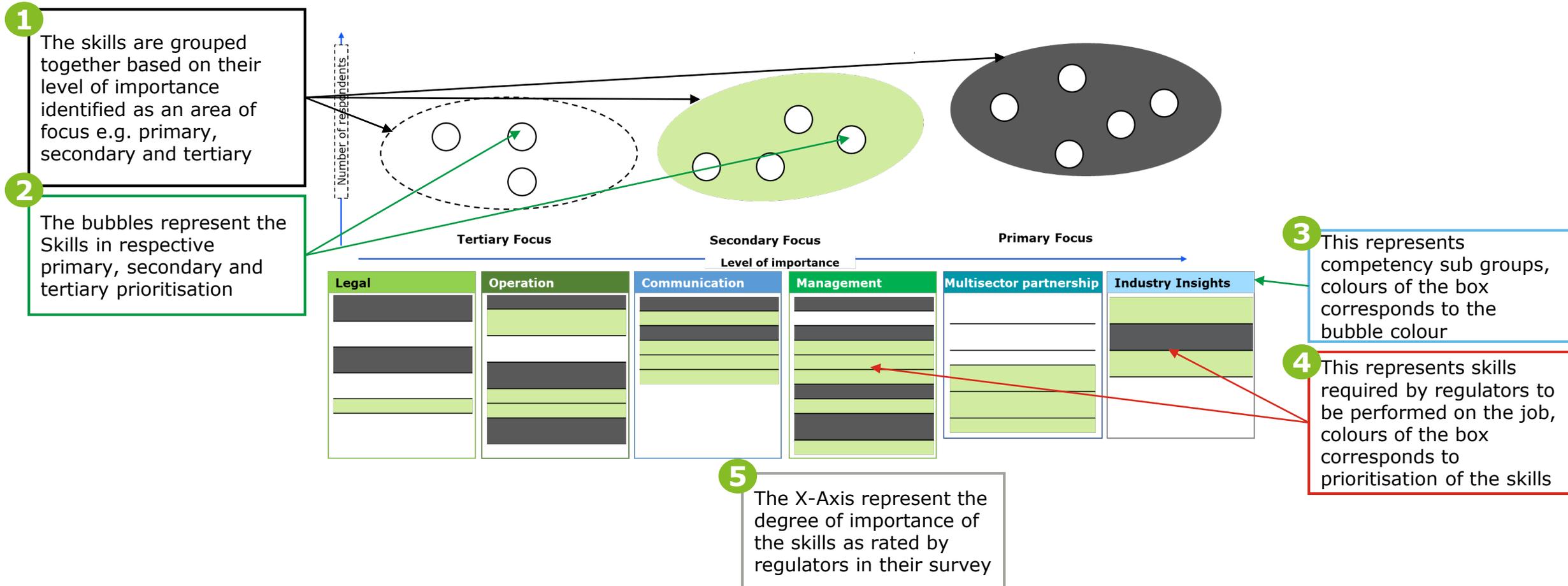
Across Product Life-Cycle

Domains:

- Premarket Evaluation
- Clinical Oversight
- Laboratory Testing
- Manufacturing Control
- Distribution Control
- Post-market Monitoring

How to read findings from Self Assessment Survey in the framework

The different skills under the competency groupings are scored based on the level of importance provided by regulators. The data was then plotted to identify logical "clusters of skills" that need to be prioritized for training needs. These have been identified as "Primary", "Secondary" and "Tertiary"



Next Step

- Harmonize the white paper terminology with IMDRF
- Work on the Curriculum for both regulators and industries based on the competencies.

Thank you