8 December 2020

Analysis and summaries of public consultation results

European Medicines Agencies Network Strategy to 2025

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1. Introduction

In order to ensure that the views of stakeholders are taken into account in planning for future medicines regulation in the EU, a 2-month public consultation was launched on 6 July 2020, using the online survey tool, EU Survey. The consultation asked stakeholders for their input on the European Medicines Agencies Network Strategy to 2025.

The questionnaire included 3 sections: 1) Stakeholder information 2) Overall Strategy and 3) Strategic focus areas (found in Annex 1). A total of 29 questions were included in the survey: 2 questions for Stakeholder information, 4 questions on overall strategy and 4 questions for each Strategy focus area. Qualitative information was collected through free-text boxes and quantitative preference clarification through two different Likert scales.

Public consultation questionnaire questions:

Question 1: What stakeholder, partner or group do you represent?

Question 2: Please indicate which area is relevant to your area of interest?

Question 3: Having read the proposed strategy, how would you rate it in general terms?

Question 4: Are there any significant elements missing in this strategy?

Question 5: Prioritisation of the joint EMA/HMA goals for each strategic theme

Question 6: Do the objectives adequately address the challenges ahead?

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Question 9: Are there any other ongoing or planned initiatives that should be considered for this proposed strategic theme area?

Any other comments?

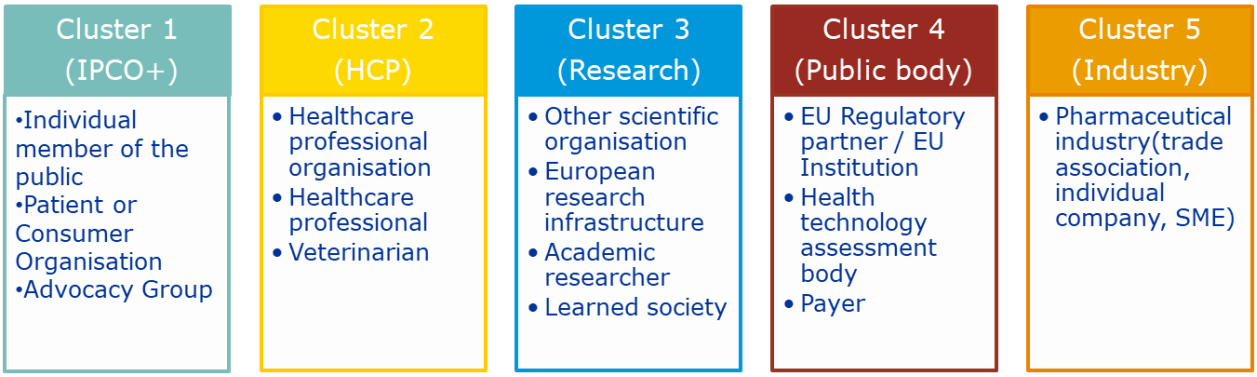
2. Methodology of analysis

Both quantitative and qualitative analysis were undertaken for different questions of the survey. For the quantitative analysis, the analysis was done using Microsoft excel. For the survey's open-ended questions, a framework method, as used for the Regulatory Science Strategy (RSS) to 2025, was employed – see Section 2.3, below. In order to ensure that there was no potential sample size bias for the different stakeholder groups, responses from the survey were weighted neutrally, regardless of the size of the stakeholder, or where there were combined responses of several individuals.

2.1. Characterisation of survey respondents

Questions 1 and 2 were used to gather information about the respondents and allowed contributors to select a type of stakeholder they represented. The authors used the same characterisation grouping as done in the RSS public consultation analysis and grouped the different survey respondents into five different stakeholder clusters representing five entities (Figure 1).

Figure 1. Responses received to the public consultation by stakeholder type



2.2. Quantitative data analysis

Responses to the survey's questions 3 and 5 on overall strategy were analysed descriptively. For question 3, stakeholders were asked to rate their overall views of the strategy through a 5-point Likert scale (Highly dissatisfied; Dissatisfied; Neutral; Satisfied; Highlight satisfied). The analysis looked at the total number of each scale and an aggregated analysis across the stakeholder groups.

A different 5-point Likert scale is used for Question 5, in which responders could provide a more detailed feedback on their prioritisation of the goals per strategic focus area. A range of numerical values from 1 to 5 were assigned to the Likert Scale to weigh the responses: (1) Not important; (2) Less important; (3) Moderately important; (4) Important; (5) Very important. The overall mean score per goals of each strategic focus areas was calculated and a comparison of all goals by mean score was undertaken. In addition, a sub-analysis of the mean score per stakeholder cluster for each goal was done. It is significant to note that stakeholders were asked to provide no feedback to areas outside of their interest or experience.

2.3. Qualitative data analysis

Responses to the survey's open-ended questions 4, 6, 7, 8 and 9 were analysed thematically by four researchers. A framework method was chosen for thematic analysis as it enables multiple researchers to independently analyse one large dataset[1,2] following five iterative stages. Table 1 describes the application of the five iterative steps of the framework method as clarified by Lacey and Luff[2] and used in the RSS public consultation analysis 1) familiarisation, 2) identifying a thematic framework, 3) coding, 4) summarising and 5) mapping and interpretation.

Table 1. *Iterative steps of the framework method*

Stages	*Description*
Familiarisation	The answers to the open-ended questions 4, 6, 7, 8 and 9 of the survey were systematically read by the researchers, who conversed amongst each other to clarify and better understand those answers that were unclear or puzzling.
Identifying a thematic framework	The researchers agreed on different types of categories and labels to assign to each participants' answers ("coding", see step 3) and discussed the reasoning of the coding and classification. The thematic framework was further developed

[1] Gale N, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. BMC medical research methodology. 2013;13(1):117.
[2] Lacey A, Luff D. Qualitative Research Analysis: The NIHR RDS for the East Midlands / Yorkshire & the Humber; 2007.

Stages	Description
	and refined during the subsequent stages. Researchers also identified different proposed actions and changes to the joint Network strategy and categorised these by Theme, goal and, if possible, objective area.
Coding	The coding both guided the responses provided by the contributors ("open coding") and what type of categories the researchers wanted to identify. The researchers coded the different identified actions/changes as either "applicable" or "not applicable" or "unclear" or "covered" and for question 4 also coded the overall feeling of the comments on objectives with "Positive", "Negative" or Neutral"
Summarising	When themes were identified in 2 or more responses, they were summarised per question, per stakeholder cluster, and/or per strategic focus area in Microsoft Excel. In a stepwise manner, the researchers: i) drafted a summary for each question by stakeholder cluster ii) convened to discuss and reach consensus about these summaries.
Mapping and interpretation	Using the summaries created in stage 4, the researchers searched for overarching themes in the data. Interpretations were made by discussing and reviewing the summaries and by making associations within and across stakeholder groups.

The analysis subgroup decided not to blind the responses (i.e. removing identifying information from question 1 for each response received), as they believed it would add value to know the perspective of the respondent when analysing the comments.

3. Results

3.1. Overall number of responses and stakeholder satisfaction with the strategy

A total of 177 responses to the survey were received, with a wide spread of responses across the different cluster groups. Of these, 147 stakeholders indicated their area of interest in human medicines, 11 for veterinary medicines and 19 for both areas. **Three-quarters of stakeholders were either satisfied or highly satisfied with the overall strategy, with only 11 dissatisfied or highly dissatisfied and 32 neutral (Figure 3).**

As in Figure 2, a total of 46 responses were received for Cluster 1 (IPCO) comprising individual members of the public, patient or consumer organisations and advocacy groups. There were 15 responses from individual members of the public (13 interested in human area and 2 for both areas) and 30 from patient and consumer organisations. In addition, feedback was received from one other respondent. Around 78% of stakeholders within this cluster were either satisfied or highly satisfied with the overall strategy, with 4% dissatisfied/highly dissatisfied.

For Cluster 2 (Healthcare professionals), a total of 32 responses were gathered, 7 of which were also interested in veterinarian area. This cluster included: 8 individual healthcare professionals, 2 veterinarians, and 22 from organisations including the major ones at European level representing national medical and learned societies across Europe. This cluster was the most satisfied with the joint network strategy with a total of 91% rating it above satisfied, with no dissatisfied/highly dissatisfied.

Around 23 responses were collected for Cluster 3 (research), 5 of which responded also for veterinary area, including 2 responses from European research infrastructures; 5 learned societies; 3 individual researchers; 1 research funder; 2 scientific organisations and 12 other scientific organisations. 74% of research stakeholders rated the strategy as either satisfied or highly satisfied, with 4% dissatisfied/highly dissatisfied.

A total of 23 responses (4 of which are interested in both areas and 4 others particularly to the veterinary area) were received for Cluster 4 (public bodies), including 5 from medicines regulatory agencies (FR, DE (H and V), SE, BE), 12 from other EU public bodies and 4 notified bodies. There were 6 responses from downstream decision-makers, including 2 health technology assessment bodies and 4 payer organisations. A large majority (83%) of stakeholders within cluster 4 rated this overall strategy above satisfied, with 4% dissatisfied/highly dissatisfied.

From Cluster 5 (Industry), 53 responses were received (4 of which responded with interest in veterinary area and 4 in human and veterinary medicines), including 15 from the main trade associations spanning all industry types (originator and biologicals, generics and biosimilars, vaccines, non-prescription medicines and veterinary) and 27 from individual pharmaceutical companies. Four out of the 27 identified themselves as small and medium enterprises (SMEs). Overall, Cluster 5 had the highest proportion of respondents who were neutral (30%) and 60% rating it satisfied/highly satisfied and 10% were dissatisfied/highly dissatisfied

Figure 2. . Responses received to the public consultation by stakeholder type

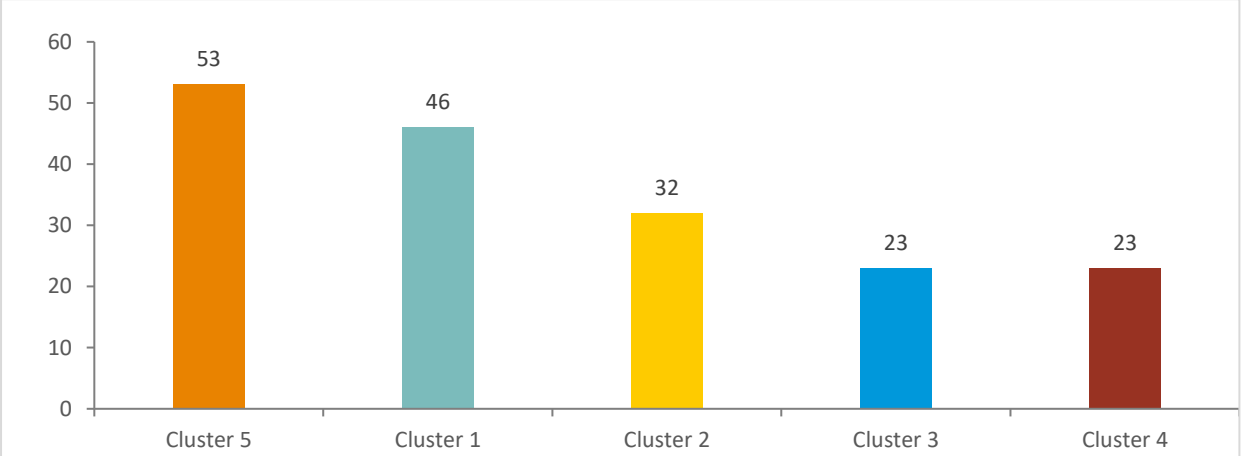
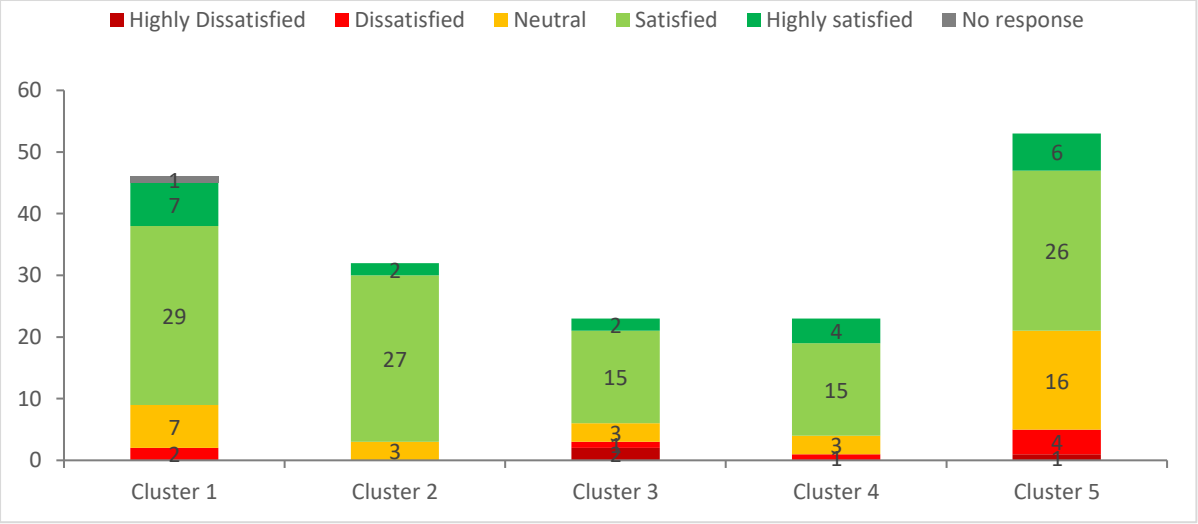


Figure 3. Overall impressions of the joint Network strategy across cluster groups

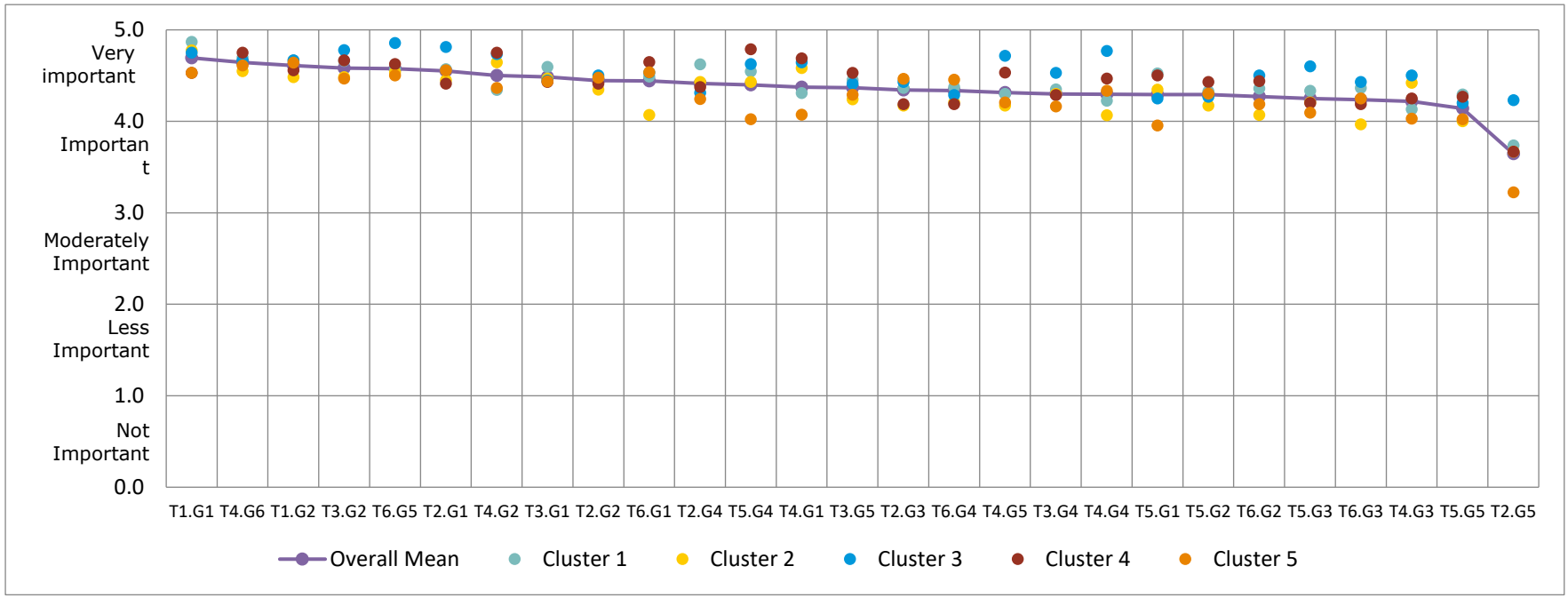


3.2. Responses on the Overall Strategy

3.2.1. Quantitative analysis

Figure 4 presents a comparison of overall mean scores per goals[3] of each Strategic Theme area. The overall mean for each goal is calculated as the mean of all five clusters with equal weights and goals are ordered from largest to smallest overall mean. This analysis shows stakeholder opinions on the importance of the strategic goals. As seen from the chart, no goals scored an overall mean score below 3 (Moderately important) on the Likert Scale. A subtle ranking can be observed in the overall aggregated mean, with goals within Theme 1, Theme 3, Theme 4 and Theme 6 all with the highest overall mean score of 4.6 or above.

Figure 4. Overall importance of all goals across each Strategic Focus area by mean (Question 5)



[3] Goals referenced here are linked to the draft document of European medicines agencies network strategy to 2025 for consultation, dated 3 July 2020.

The sub-analysis per cluster illustrates the different views of each stakeholder cluster per Strategic Theme goals. Goal 5 of Theme 2 had the lowest overall mean score of 3.6 as there was a larger mean difference between clusters. However, as this goal is mainly related to veterinary area, a specific sub-analysis was undertaken to see the overall views of stakeholders only interested in veterinary area and the overall mean calculated was 4.2.

3.2.2. Qualitative analysis

3.2.2.1. Summary of responses to Question 4 and "Any other comments"

Half of the respondents identified in **Cluster 1 - Individual members of the public, patient or consumer organisations and advocacy groups (N=46)** considered there were some significant elements missing in the strategy, namely that the strategy should: i) be more explicit and more ambitious in relation to patient engagement and set standards across the Network; ii) promote approval standards based on comparative clinical trials; iii) facilitate greater integration of regulatory and reimbursement processes; and iv) foster the strengthening of post-marketing surveillance and safety monitoring.

As additional comments, stakeholders in this cluster pointed to the need to foster the conduct of trials in real-world settings and address patient-relevant questions.

A third of the respondents in **Cluster 2 - Healthcare professionals and healthcare professional organisations (N=12)** replied that they considered that there were significant elements missing in the strategy. The comments received were heterogeneous in nature. Several important points were brought forward on a wide number of areas that could be further developed in the strategy, as outlined in Annex 1. As additional comments, appreciation for the strategy was expressed and it was also brought forward that the lessons learned from the COVID-19 pandemic should be taken into account and that a clarification on how stakeholders can contribute to the implementation of the strategy is needed.

More than one respondent in **Cluster 3 – Research (N=23)** noted that the strategy lacks a focus on paediatric treatments and encouraged to include the issue in the final strategy. Furthermore, more than one respondent requested that the Network prioritises to develop standards for complementary and alternative medicines (CAMs) during the strategy period.

There were no overlaps in responses from **Cluster 4 - Public bodies (N=23)** concerning the content of the strategy. More than one respondent commented on the overall composition of the document. More specifically, it was mentioned that the presentation of the strategic goals across the themes is inconsistent. Furthermore, there was a request to prioritise the six strategic theme areas.

Stakeholders in **Cluster 5 - Pharmaceutical industry (trade association, individual company, SME (N=31))** were generally positive about the document and provided input on a number of different strategic theme areas as well as on the overall document. Many encouraged greater collaboration between industry stakeholders, EMA and national competent authorities (NCAs) with early dialogue on several topics, e.g. radiopharmaceuticals.

Respondents repeatedly mentioned the ambitious nature of the strategy and the need to include strategic prioritisation, timelines, specific actions, funding and measurable outcomes. They suggested adding clarification on EMA and NCA responsibilities in meeting the objectives, and how these will link with the proposed actions from EMA's regulatory science strategy (RSS). A few participants mentioned that the objectives appear to be in areas or involve actions in which the European medicines regulatory network (EMRN) may have a role but should not be leading. They stated that the focus of the strategy

should be on activities that are within the EMRN's responsibility and that do not detract from its core roles.

Figure 5. Top key words from the feedback received for question 4.

The current regulatory procedures were criticised by a number of respondents for their administrative burden and lack of speed and flexibility, with one stakeholder highlighting the specific impact on the veterinary sector. Several supported the promotion of regulatory optimisation and request more information should be included on how this would be achieved. A more flexible, integrated product support mechanism was recommended by a few stakeholders. Furthermore, it was highlighted that regulatory pathways and the connected consultation processes should be adapted to address emerging digital solutions, including new digital technology. A few supported the promotion of regulatory optimisation and emphasised that engagement of regulatory science to deliver on new approaches to the lifecycle of innovation is essential. An improvement of existing regulatory pathways, faster scientific advice (SA) to keep pace with other jurisdictions, expanding early access schemes such as PRIME should be included.

In addition, a new way of looking at regulatory process is to incorporate the lessons learned from COVID-19 experience and a large majority supported that these measures (regulatory flexibilities such as rolling review, accelerated SA) are extended beyond COVID-19. Other learnings from COVID-19 should drive a reflection for a better EU health threat preparedness and optimize the business continuity practices. Objectives should also include the enhancement of reporting tools during crisis, the collaboration with established channels with the EU Commission and several stakeholders and the centralisation role of the EMA.

Many responses proposed the addition of a new standalone patient focused goal, as currently the essential patient focus is only referenced in a few minor sections throughout the different strategic themes. They suggested to consider adding advance patient-focused medicines development within Theme 3. Another proposal suggested to add an overarching goal to cover the need for a holistic and effective approach to translate scientific innovation into medicinal products addressing the unmet medical needs of patients in the EU and worldwide

To foster research in the EU, innovation in the area of Clinical Trial conduct needs particular support by the Network and a number of stakeholders suggested that this topic should be escalated from an

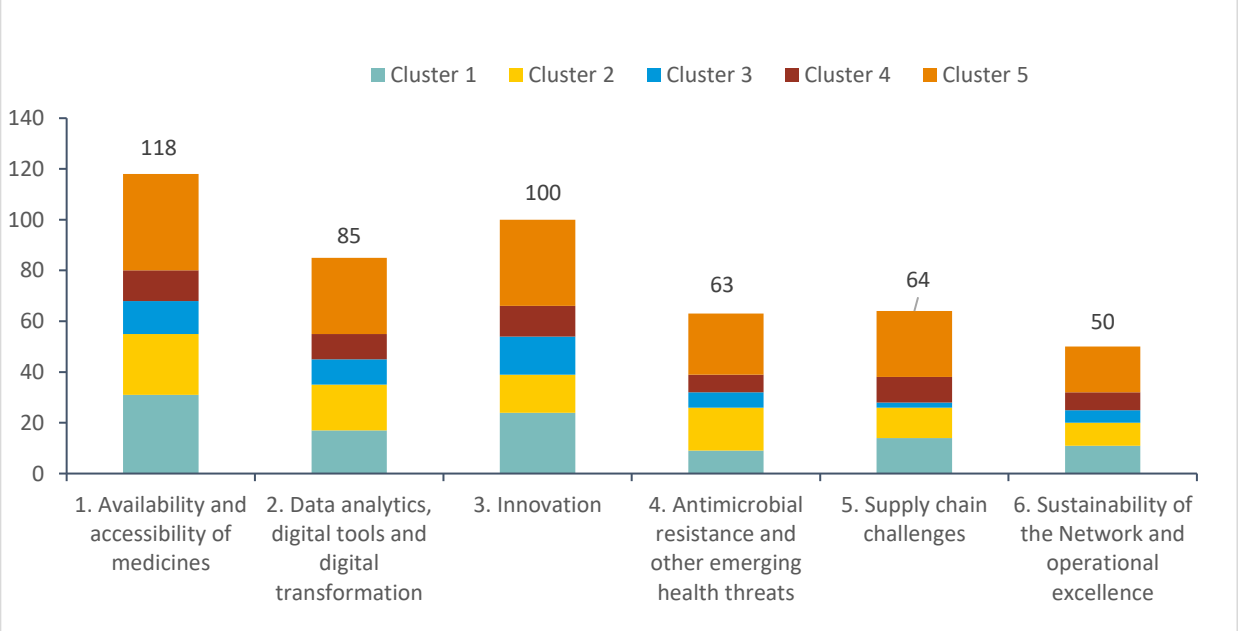
objective to either a goal or theme. The timely and smooth implementation of Clinical Trials legislation was also seen as a key element missing in the strategy. Furthermore, a standardised approach to the use of real-world data and evidence (RWD/RWE) should be adopted to encourage its use in evidence generation for clinical trials, and throughout the medicine lifecycle. This could be implemented through RWE use cases or pilot programmes and should be highlighted in the document. Moreover, in order to foster innovations, the Network needs to work with other stakeholders including policy makers, academia and industry to facilitate the development of and access to innovative vaccines and this should be emphasized in the document.

Additionally, a large number of individual comments were provided per cluster group on whether the objectives adequately address the challenges ahead and can be found in **Annex 1.** Furthermore, **Figure 5** displays some of the keywords extracted from the summary above and the individual comments in the Annex.

3.3. Responses per Strategic focus area

Figure 6 shows the contribution received on each strategic focus area by cluster group. As seen from this chart, input was received across all strategic focus areas from a wide range of stakeholders. "Availability and accessibility of medicines" received the highest input from 118 different stakeholders, followed by "Innovation". "Data analytics, digital tools and digital transformation" was the third most selected strategic focus area. Theme 4 and Theme 5 all received similar number of stakeholder responses. Theme 6 was the least selected strategic focus area probably due to its inherent regulatory scope.

Figure 6. Comparison of cluster responses received per Strategic focus area.



Summary of responses to Question 6-9

Question 6: Do the objectives adequately address the challenges ahead?

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

The annex contains summarised lists of concrete actions that could support or complement EMA/HMA network activities (Question 8). For Question 9, on other ongoing or planned initiatives that should be considered for the particular strategic focus area, these were reviewed and for those related to the EU Medicines Agencies Network, were noted and highlighted in section 4 "Discussion".

3.3.1. Responses per Strategic focus area: Accessibility and availability of medicines

3.3.1.1. Question 6: Do the objectives adequately address the challenges ahead?

A large majority of **individual members of the public, patient or consumer organisations and advocacy groups** (N=21) provided positive comments that the objective addressed the challenges. Responders asked to ensure that data gathering exercise on medicine shortages is finalised and the results are shared with all stakeholders including patients. In addition, an assessment of the impact of shortages on patients could be included as an objective. Overall patient safety should be at the core of EMA/HMA activities, particularly for shortage prevention and management. A few stakeholders recommended strengthening the existing EU pharmaceutical legislative framework to improve notification of medicines shortages and reinforce obligations of the Market Authorisation Holders (MAHs) and wholesalers to supply the market.

A few **healthcare professionals, veterinarians and their organisations** (**Cluster 2,** N = 13) raised important points, however the areas that were addressed were with regards to i) EU HTA regulation ii) marketing of authorised medicines and iii) communication on availability, accessibility and shortage issues of medicines. A few contributions urged EMA/HMA to be involved in facilitating synergies between regulators and HTA bodies. Many agreed on the need to increase transparency and particularly with an overview of the marketing status of centrally authorised medicines. It was recommended to subject the granting of the marketing authorisation to a commitment by pharmaceutical companies to launch the medicinal products in all EU countries at the same time, once authorised. In addition, responses indicated the need to establish an information flow system to ensure good and timely communication of availability and accessibility issues as well as medicines shortages, with all stakeholders (MAHs, wholesalers, authorities and healthcare professionals, veterinarians). The information provided should explain why a product is unavailable, how long the shortage is expected to last, mitigation plans taken and alternatives therapies for patient.

The majority of input received from **cluster 3 (research N=11)** was heterogeneous. Two highlighted that the strategy should include the area of paediatric medicines, as there is a lack of appropriate formulations and dosages for children, which was emphasized more during COVID-19 pandemic. Often there are no early access initiatives for innovative and advanced therapies for children.

Out of the few responses for **public bodies (cluster 4, N= 9),** some explicitly mentioned the need to take more into account the veterinary sector and animal health. Although the implementation of the veterinary medicine regulation will provide measures for increasing the availability of veterinary medicines, there are several causes of shortages that are not fully covered by the new regulation. In addition, issues that arise for medicines for human use are very similar to those for veterinary use and additional changes to EU or national legislation to improve the supply of veterinary medicines should be considered. Furthermore, a small number of respondents stated that methods developed for using the post-licensing evidence are important in order to raise the quality of the evidence and make it easier to use in decision makings. A definition should be created and include requirements and criteria to be fulfilled for any shift of data generation into post licensing. Moreover, it is crucial that post-licensing evidence is shared between regulators, HTA bodies and payers to reduce uncertainties in decision making processes.

Majority of **trade associations, individual companies and SMEs (Cluster 5, N= 30)** were supportive of the objectives in the strategy document and agreed that these would help address the challenges outlined in the EMRN. Nevertheless, a large number also suggested a number of additional areas that could be considered as supplementary objectives. Furthermore, some participants found that a few of the objectives could be assigned low priority compared to others. This was evident for the objective to promote the availability and support uptake of biosimilars in healthcare systems. Although the effort was supported by a number of stakeholders, a few found particularly by this cluster that the differences in availability and uptake of biosimilars are rooted in Member States' (MSs) medicines pricing and reimbursement and procurement systems and thus are beyond the remit and responsibilities of EMRN. Regarding the objective on new metrics for accessibility of medicines, a handful stated that it did not fit with the overall goal as they believe the goal focuses on evidence generation and communication on the evidence to support decision-making.

As availability and accessibility are separate issues with different multi-factorial root causes and drivers, a small number thought that collaboration on these issues needs to involve all relevant stakeholders, including industry. This was particularly clear for accessibility goal, where responses emphasized the need for dialogue between all stakeholders, including developers of human and veterinary medicines and not just decision-makers, in order to implement effective solutions in the short and longer term. A suggestion to create a high-level multi-stakeholder forum to address the multifactorial and complex issue of access was supported by a few responses. Two responses also recommended to add an objective that underlines the need for EU regulators to contribute towards global regulatory convergence, especially in relation to CMC life cycle management.

In addition, HTA involvement in early evidence planning to improve patient access pathway and the comparative assessment as basis for later pricing and reimbursement needs decisions to be considered within the strategy. A few responses encouraged the HMA/EMA strategy to consider use of various sources of data including international RWD/RWE in a coordinated manner across the European network of regulatory and HTA authorities

Important learnings from COVID-19 experience should be transposed into a new way of cooperation with various stakeholders on drug shortages and availability. Numerous responses highlighted that the regulatory flexibilities developed during COVID-19 pandemic should be maintained and the reduction of the regulatory burden should be included as an objective. Many agreed that the development of and better use of electronic product information (ePI) and multilingual packs and leveraging digital solutions for country specific information can support the mitigation of individual drug shortages.

The objective to help identify and suggest areas where changes to EU or national legislation could improve supply was endorsed by many contributors. Several agreed with the legislative changes for the implementation of ePI and that this should not solely be restricted to newly authorised medicines. A few recommended that the Network should also look into EU and national legislation to prevent hoarding and disproportionate stockpiling at national level, which could result in supply problems and unnecessary waste of medicines. In addition, a few responses disagreed on including legal obligations for MAHs to maintain EU stock levels as they believe this would not help address availability issues and would bring a multitude of commercial issues.

A European harmonised shortage reporting approach (such as the iSPOC) and an EU wide definition of shortages should replace the current individual national measures over time and should be more stressed in the strategy. Additionally, in order to enhance traceability of products across the supply chain, various stakeholders found the European Medicine Verification System (EMVS) to be a solution for monitoring of medicine shortages. A small number of replies understood that the section focused primarily on human medicines due to the ongoing work on the regulation on veterinary medicines, but they believe that this section should still include more provisions for veterinary medicines.

Lastly, a few replies highlighted that current pricing and reimbursement landscape may prove challenging for developers and suggested initiating conversation to reduce the timelines between the beginning of the regulatory assessment and price and reimbursement agreement.

A large number of individual comments were provided per cluster group on whether the objectives adequately address the challenges ahead and can be found in **Annex 1.** Furthermore, **Figure 7** illustrates some of the keywords extracted from the summary above and the individual comments in the Annex.

3.3.1.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

For **cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups, N=14)**, a few stakeholders had similar views on whether there were any other challenges that should be addressed within this strategic theme area, whereas majority of comments were heterogenous. As information exchange in case of shortages does not exist in all Member States, a few participants thought this should be highlighted as a challenge. A small number of contributors suggested that communication and cooperation mechanisms should be developed, assimilated and applied in countries and regions to facilitate dissemination to wider public. Some responses found that the strategy was missing references on the challenge with regards to authorised products not marketed and suggested that an additional objective should be included to address this issue.

A small number of responders (N=8) within cluster 2 (**healthcare professionals, veterinarians and their organisations**) provided their views on whether there were any other challenges that needed to be addressed. The difficulty of finding a harmonised definition of critical medicines which can be used across the EU was highlighted as a missing challenge in the strategy. Replies suggested creating a catalogue of critical medicines in the EU and consulting the WHO "Model List of Essential Medicines (EML)" as a starting point, to work towards creating a critical medicines or essential medicines list adapted for the EU.

Most comments received for this question from **academic researchers, learned societies, European research infrastructures and other scientific organisations** (Cluster 3, N=7) were mixed. The main challenge that was highlighted by a few participants was the lack of focus on paediatric medicines, particularly with regards to innovative medicines research, development, availability and accessibility.

Limited responses were submitted for **cluster 4 (public bodies, N=5),** with only two homogenous comments on the challenges due to approval of orphan medicines. Accessibility issues are linked with unaffordability of medicines by manufacturers who are given more years of exclusivity for a greater number of drugs which are being defined as orphans.

A large number of participants within **cluster 5 (industry, N= 27)** echoed each other's feedback on a number of key challenges that should be further accentuated or addressed. One of these challenges was the need for a consistent and workable definition of shortages (covering both the supply and demand sides), which must be adapted across all MSs in order to ensure harmonisation. Many highlighted that EU regulators should agree on standardised reporting requirements on clearly defined shortages based on patient needs and not on national demand, giving priority to critical products with high potential impact. Information on shortages should be streamlined with an effective alert system as well as an alignment across the data provided from different sources. The information contained in the national data repositories set up in the context of the Falsified Medicines Directive (FMD), i.e. the EMVS, could potentially be used to monitor net stocks levels at an aggregated level. Furthermore, a list of essential medicines for EU should be looked into.

The commoditisation of products and current burdensome regulatory landscape are challenging the sustainability of the European pharmaceutical supply chain, leading to rationalisation of the supply chain and consequently to an increased possibility of shortages and availability issues. Participants particularly focused on the burden of the application of the EU variations legislation and the need to use the regulation for minor administrative changes. The work done by the Regulatory Optimisation Group (ROG) to simplify and automate regulatory processes was supported and contributors recommended to revise the variation procedure, following internationally harmonised standards. Many also suggested to leverage lessons learned from COVID-19 pandemic and expand the regulatory flexibilities introduced in the context of COVID-19, e.g. rolling reviews.

Furthermore, the concept of a universal EU-pack, where a single European Stock Keeping Unit (SKU) with a shared label should be explored and piloted. A few responses thought this would significantly contribute to mitigating shortages, support availability for small markets and help minimise falsified medicines. A number of stakeholders supported a harmonised implementation of ePI in all EU countries. Some replies suggested an investment in fast implementation of the SPOR database and interconnectivity between digital projects/ tools within the Network with a simplified and digitalised framework. This would increase the overall ability to prevent supply disruptions and would also enable meeting the increased requirements and expectations from the external environment.

Many stressed that the strategy should better reflect the need for increased collaboration between Regulators, HTA bodies and payers through early dialogue to better connect the different decision-making steps across the lifecycle of a medicine. The importance of utilizing RWD to characterize the efficacy of therapies in the post-marketing setting to support decision making was seen as an important aspect to be included in the strategy by a number of industry stakeholders. Moreover, many found that centralization of reimbursement evaluation and approval would benefit accessibility of innovative medicines across all EU countries. Replies also suggested that a cross stakeholder dialogue could greatly improve availability and accessibility of medicines and some proposed to establish a dedicated multi-stakeholders' group to allow this.

In **Annex I**, a list of varied individual comments can be found per cluster groups which also addresses whether other challenges should be included by EMA/HMA for this strategic focus area. **Figure 7** displays some of the keywords extracted from the summary above and the individual comments in the Annex.

Figure 7. Top key words from feedback for Accessibility and availability of medicines

3.3.2. Responses per Strategic focus area: Data analytics, digital tools and digital transformation

3.3.2.1. Question 6: Do the objectives adequately address the challenges ahead?

When it comes to the question of whether the objectives in the strategy adequately meet the outlined challenges, more than one of stakeholders within **cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups)** highlighted two concerns.

First, worries are expressed about the paradigm shift from an emphasis on pre-approval activities to post-approval activities by the regulatory authorities that will be driven by the use of big data in approving new medicines in the future. Thus, some of the stakeholders fear that marketing authorisation requirements will be weakened by shifting the provision of evidence before approval to real world data after marketing authorisation. Second, more than one stakeholder within the cluster encourage that paediatric treatment is explicitly mentioned in the chapter. The lack of emphasis on paediatric treatment is an issue mentioned across the strategic focus areas. Finally, more than one stakeholder emphasised that healthcare data should not be regarded as a commercial commodity.

As for **cluster 2 (healthcare professionals – both within the human and veterinary domain)**, more than one of the stakeholders expressed the same concern about the paradigm shift from an emphasis on pre-approval activities to post-approval activities that was also highlighted by cluster 1. Furthermore, more than one of the healthcare professionals from the veterinary domain requested that the strategy elaborate further on the impact on the veterinary domain.

Moving to **cluster 3 (research)**, the stakeholders point to the lack of a paediatric perspective on the issue of data analytics. Furthermore, more than one of the research stakeholders called for more emphasis on access to data in the strategy.

The comments of the stakeholders within **cluster 4 (public body)** are very diverse. More than one of the stakeholders point out though, that they are concerned about whether the Network poses the necessary competences to perform reviews of big data.

Finally, many of the **industry stakeholders (cluster 5)** indicate that they endorse the goals set for data analytics, digital tools and digital transformation in the strategy. On the other hand, more than one stakeholder within the cluster have pointed to the following shortcomings of the strategy.

First, a number of stakeholders request that the development of standards for the use of Real-World Data (RWD) becomes a part of the strategy. Second, more than one of the stakeholders are concerned whether the Network poses the necessary competences to implement the goals put forward. Third, more than two stakeholders have pointed out that there should be a larger emphasis on the differences between the need of the human domain and the veterinary domain respectively. Fourth, the importance of digitalisation is emphasized by more than one stakeholder. Finally, a number of stakeholders point out the importance of international collaboration (especially with FDA) when it comes to data analytics and not least establishing the supporting digital infrastructure.

In addition to the comments reflected above, a number of individual comments relating to the question of whether the objectives meet the challenges were submitted during the consultation. These comments are listed in **Annex 1**. Some of the top keywords extracted from the summary above and the individual comments in the **Figure 8.**

3.3.2.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

More than one of the stakeholders within **cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups)** have pointed out that the question of data transparency (in the perspective of patients' privacy) should be further addressed in the strategy.

In addition, more than one stakeholder within **cluster 2 (healthcare professionals – both within the human and veterinary domain)** pinpoint a number of challenges they want to be addressed in the strategy. First, it is the view of some of the stakeholders that cyber security is not adequately addressed in the strategy. Second, a more comprehensive outline of how GDPR is affecting the implementation of the goals of the strategy is requested. Third, a number of stakeholder points out the importance of ensuring interoperability between different IT-systems, databases etc.

The importance of ensuring interoperability between different IT-systems is also addressed by a number of stakeholders within **cluster 3 (research)**. The pool of comments of the stakeholders in this cluster is otherwise fragmented.

None of the **public bodies (cluster 4)** who have participated in the public consultation have commented on the question of missing challenges in the strategy.

Finally, more than one stakeholder within **cluster 5 (industry)** have pointed out five challenges, which they think need to be addressed in the strategy. First, it has been pointed out that the question of data transparency should be further addressed in the strategy. Second, a number of stakeholders want the strategy to address how the Network will perform data governance in the coming years. Third, more than one industry stakeholder express concern about whether the Network is able to adequately fund the implementation of the strategic goals. Fourth, a number of the industry stakeholders call for more emphasis on the need for interoperability between IT-systems/databases in the strategy. Fifth, a request to outline how GDPR is affecting the implementation of the goals of the strategy is made by more than one industry stakeholder.

In addition to the comments reflected above, a number of individual comments relating to the question of whether other challenges should be addressed by the EMA/HMA Network in this area were submitted during the consultation. These comments are listed in **Annex 1**. Some of the top keywords extracted from the summary above and the individual comments in the **Figure 8.**

Figure 8. Top key words from feedback for Data analytics, digital tools and digital transformation

3.3.3. Responses per Strategic focus area: Innovation

3.3.3.1. Question 6: Do the objectives adequately address the challenges ahead?

Some **individual members of the public, patient or consumer organisations and advocacy groups** (N=24) identified the following points as missing or in need of further coverage within the proposed strategy and the objectives for the innovation theme: clearer recommendations on limiting accelerated assessments to unmet medical needs and investing in innovative trial design; additional detail on how to pool resources and enhance collaboration; a need to be more explicit on how to promote systematic patient involvement across the lifecycle to realise true value of innovation, and understand and manage risks.

Amongst the **healthcare professionals, veterinarians and their organisations** (N=15) who have participated in the public consultation only individual comments have been identified but were not repeated.

The cluster gathering **academic researchers, learned societies, European research infrastructures and other scientific organisations** (N=15) highlighted their expectation to see the strategy better addressing how to foster innovative clinical trial designs and methodologies such as basket trials, umbrella trials and platform trials as well as innovation in paediatric research.

Public bodies including **EU regulatory partners and institutions, health technology assessment bodies and payers** (N=12) pointed to the need to clarify how collaboration with notified bodies responsible for the certification of medical devices is foreseen.

Within the pharmaceutical industry cluster, incorporating comments received from **trade associations, individual companies and SMEs** (N=34), different stakeholders highlighted that they would expect to see strategic thinking of regulatory authorities beyond innovative medicines approval and encompassing all different types of innovation. They also called for lessons learned from the response to COVID-19 (rapid scientific advice, rolling reviews, labelling, etc.) to be further addressed. Several comments were also made around SA, PRIME, innovative clinical trials, coordination between assessment bodies and use of RWD, with many points raised individually.

In addition to the comments reflected above, a number of individual comments relating to the question of whether other challenges should be addressed by the EMA/HMA Network in this area were submitted during the consultation. These comments are listed in **Annex 1**. In addition, **Figure 9** illustrates the top key words extracted from summary above and individual comments in the Annex.

3.3.3.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Within the pharmaceutical industry cluster, comments received from **trade associations, individual companies and SMEs** (N=34), mainly concentrated on areas for improvement around SA, PRIME, innovative clinical trials, coordination between assessment bodies and use of RWD.

Many points were raised individually by other cluster groupS and these are listed in **Annex 1**. Some of the top keywords extracted from the summary above and the individual comments can be found in **Figure 9.**

Figure 9. *Top key words from feedback for Innovation*

3.3.4. Responses per Strategic focus area: Antimicrobial resistance and other emerging health threats

3.3.4.1. Question 6: Do the objectives adequately address the challenges ahead?

For **clusters 1 (individual members of the public/patients) and 4 (public body)**, small number of responses were received and the replies were heterogenous and no repeated themes emerged.

A fifth of respondents of **cluster 2 (Healthcare professionals)** provided comments (N=6). A need to recognise the role of different healthcare professionals (HCPs) in battling AMR was brought forward in several replies, that also pointed to the need for collaboration and communication between HCPs, health service providers, regulators, industry, patients and the public.

A couple of replies emphasised that it is important to prioritise tackling AMR, to contribute to keeping AMR high on the EU and national policy agendas and to support MSs' efforts to implement their One Health action plans , including the need for a dedicated EU fund or funds earmarked from the current EU budget to support MSs in this effort. The Network should also outline a plan for how to relate to the Farm to Fork strategy.

It was also noted that the strategy should clarify that new business models should be needs-driven and based on the principle of de-linking the price and volume of antibiotic sales from R&D costs.

The need for the strategy to emphasise infection prevention and control in relation to AMR-related actions as well as the need to reduce inappropriate prescribing and the issue of off-label use with a view to AMR was supported by stakeholders in the cluster. Highlighted was also the need for continued

global cooperation and exploration of ERA to address the potential impact of environmental residues of antimicrobials on the emerge and spread of AMR.

Another important objective that was pointed out is a focus on guaranteeing security of supply for antimicrobials and on the further promotion of their responsible use.

A quarter of respondents from **cluster 3 (Research)** provided comments (N=6). A few of them pointed to that the benefit-risk for older products should be reviewed, and removal from the market should be considered. Attention should also be given to the presence of fixed dose combinations containing antibiotics on the market, which are likely to have an impact on AMR.

It was also pointed out that the generation of high-quality data as part of regulatory approval processes will be essential to ensure that the true value of new antibiotics can be defined. Non-validated endpoints should be avoided, and post market obligations must be delivered in full and on time.

The need for a full root cause analysis into the reasons why new antibiotics are not marketed on the European market was supported. It was further stated that fostering development of new antimicrobials including new antibacterials should be national, European and global. Also, any incentives need to be aligned with the EC Pharmaceutical Strategy

Responses were received from more than a third of the respondents in **cluster 5 (Industry)** (n=19). The need to take lessons learned from the current COVID-19 pandemic into account for the future including regulatory agility and dialogue with industry was raised by several stakeholders. An additional suggestion was to consider a global approach and international workshare processes to be put in place to allow for global response to crisis including alignment on emergency use assessments. Many also pointed out that a key focus needs to be addressing the link between regulatory evidence and access discussions (HTA, payer). It was highlighted that the EMRN is ideally positioned to strengthen dialogue and engagement with HTA bodies, HTA and reimbursement reforms may be required.

A few responses highlighted that the role of vaccines in the fight against AMR was considered to not be adequately addressed and it was supported that this should be included where appropriate. It was further mentioned that in line with the EU One Health Action Plan against AMR, focus should also be on other anti-infectives affected by AMR, as well as on maintaining access to effective antibiotics currently available. A number of comments also referred to the need of both push and pull incentives, and that those incentives should be sustainable and sufficient to stimulate R&D globally across the full R&D lifecycle, in order to see an impactful long-term change on the pipeline of new products.

The need for innovation to be fostered and the regulatory framework to be adapted to enable efficient pathways for drug development in this area was supported and it was pointed out that innovation including precision medicine, can contribute to improved patient care with safer, more compliant and more efficient use with less dosing errors to promote less antibiotic waste and thus less resistance.

Slightly conflicting views were expressed with regards to the environment by two respondents, on the one hand it was considered that environmental concerns related to AMR from all sources (e.g., manufacturing, sanitation, runoff, waste-water treatment should be addressed, and should not be limited to the veterinary sector. On the other hand, it was expressed that individual MAHs should not be burdened with increased regulation, especially when manufacturing older antibiotics and that any data gap filling needs to be effectively prioritised, based on risk and science.

In addition to the comments reflected above, a number of individual comments relating to the question of whether the objectives meet the challenges were submitted during the consultation. These comments are listed in **Annex 1**.

3.3.4.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

A small number of respondents from **clusters 2 (healthcare professionals)** and **4 (public body)** provided heterogenous comments on the theme.

Only four respondents from **cluster 1 (individual members of the public/patients)** provided comments (N=4). Two stakeholders in the cluster commented that the network should collaborate further both within the EU (EC & ECDC) and globally with WHO and ICH within this theme but also for example regarding communication to foster confidence in vaccination.

Two stakeholders in **cluster 3 (research)** expressed that new effective financing models to ensure affordable access to antibiotics need to be supported, and that the network should support de-linkage and avoid value-based pricing.

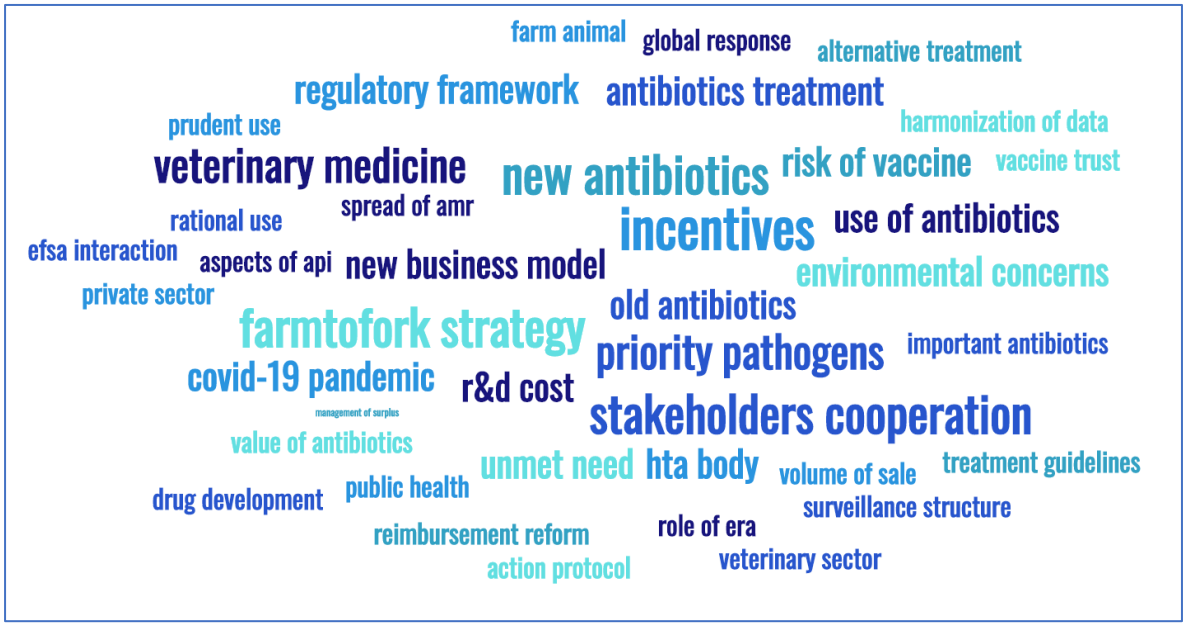
A quarter of the respondents in **cluster 5 (industry)** provided comments on the theme. Several provided similar input, and many comments were also similar to those given under question 6. Many expressed that the need to apply COVID-19 lessons learned with respect to accelerated vaccine development should be addressed, including specific pathways, surveillance structures and incentives. Further should greater use of all existing tools in the current regulatory framework (including PRIME) for antimicrobial products (including vaccines) that address serious or life-threatening infections and/or are of major interest for public health be considered. Also, appropriate communication on procedures, decision-making process, benefit-risk of vaccines, etc. is essential to maintain public confidence in vaccines specifically developed to tackle emerging health threats.

Another comment similar to that made under question 6 was that payer reform is needed to better capture the societal value of antibiotics in Health Technology Assessments (HTA). It was expressed that payers form an important part of the suite of incentives needed to sustainably stimulate antimicrobial R&D. Reimbursement reform can complement and reinforce key antimicrobial stewardship components. It was pointed out, as was done under question 6, that the EMRN is ideally placed to strengthen dialogue and engagement with HTA bodies.

Several stakeholders suggested that the definition of "unmet need" should be broadened to include treatment of bacterial infections.

The individual comments relating to the question of whether there any other challenges that should be addressed by the EMA/HMA network in this area are listed in **Annex 1**.

Figure 10. *Top key words from feedback for Antimicrobial resistance and other emerging health threats*



3.3.5. Responses per Strategic focus area: Supply chain challenges

3.3.5.1. Question 6: Do the objectives adequately address the challenges ahead?

Over a fifth of the respondents in **cluster 1 (individual members of the public/patients, N= 6)** provided input. A couple commented that the possibility to link Marketing Authorisation to supply and availability should be explored, and that a diverse supply chain could be rewarded, and that the EU Commission should provide support to European countries to move the pharma industry in the Europe whereas others commented that it is not the regulators role to support a competitive EU based manufacturing base..

For **cluster 2 (Healthcare professionals, (N=6))** a fifth of the respondents commented. Many welcomed the inclusion of this strategic area, especially in the light of the COVID 19 pandemic. The strengthened regulation of the supply chain as well as traceability and monitoring could help in tackling medicine shortages, and the fragmented implementation of article 23a of Directive 2001/83/EC has led to inconsistencies. Introduction of an early warning system was supported by some stakeholders. Cluuster 2 stakeholder comments noted that the strategy needed to extend to excipients as part of assuring supply chain resilience and actions on environmental impact of manufacturing of pharmaceuticals should be identified.

An additional suggestion was that relocation of production to Europe should be prioritised for critical products,, but that the EU should also encourage a responsible and transparent pharmaceutical sector with diversified supply sources. The need to gather more data must on supply chain risks to establish exactly where their vulnerabilities lie and how its resilience can be strengthened was proposed by a number of stakeholders.

For **cluster 3 (researchers, N= 1)**, only one stakeholder provided input, and thus no repeated themes emerged.

Five stakeholders in **cluster 4 (public body**, **(N=5))** provided input. A few of them commented that the implementation of processes providing information on possible or actual disruptions in the supply chain should ideally be done at the EMA or EC level.

A third of the respondents in **cluster 5 (Industry, (N=17))** provided input on theme 5. Many provided similar or even identical comments, reflecting topics already addressed in the Network Strategy document::

- There should be one definition, one clear guidance and requirements and one system for reporting of shortages. The data stored within the National Medicines Verification Systems (NMVSs) could be harnessed to monitor medicine shortages. It is important to prevent falsified medicines from entering the legitimate supply chain and suggests that the focus should be on fully implementing and enforcing the FMD, especially the mandatory use of the EMVS.
- Enhancing inspection capacity is supported as this could help to align and uphold accepted and required standards. Further to leveraging digital tools, encouraging the use of harmonized remote risk-based inspections would be conducive to achieving this goal. There is a need to work towards the advancement of the US-EU MRA for GMP inspections for biologics, immunologics, vaccines and PDMPs to avoid double inspection, as well as establishing a UK-EU MRA. Inspection reliance can be leveraged through PIC/S and globally harmonised regulatory requirements and inspection reliance should be prioritised.
- There is a need to accelerate existing telematics programs to allow e.g. greater visibility of supply chain actors to allow faster impact analysis and smarter reaction to temporary or permanent shortages. This includes new solutions as well as e.g. EUDRA GMP and SPOR.
- GDP aspects of the supply chain should be addressed with a focus on harmonising implementation of the GDP requirements across MSs. A harmonised approach to GMDP is critical and skills and competencies should be increased across all jurisdictions, not only in EU.
- Supply chain resilience, in general, should remain a responsibility of the MAH. Providing detailed information on supply chain in MA dossiers at the time of MAA or product launch might not be helpful in assessing risk, instead leading to a disproportionate increase in administrative burden and reduction in manufacturing and supply chain agility. The sourcing of an API falls into the GMP requirements and is ensured by the QP declaration
- Several of the objectives in this theme appear to be based on a perception that poor quality practices are at the core of supply chain challenges and hence more supervision and inspections are proposed. Before implementing such solutions, however, the root causes of the challenges need to be fully analysed and understood. In addition, challenges and solutions should be considered in global context.
- The removal of barriers for new models such as continuous manufacturing, or adoption of digital technologies and approaches associated with Pharma 4.0 across the supply chain are not outlined. A key goal for the EMRN should be to have the appropriate regulatory and data privacy in place to protect patients while avoiding the EU falling behind globally.

A couple of stakeholders were concerned that the use of hospital exemptions for ATMPs for economic reasons could grow over the coming years, which could undermine regulatory oversight and protection of public health.

A few commented that supply chain resilience can best be promoted through regulatory initiatives that facilitate business continuity planning and enable implementation of technologies and systems that strengthen operational resilience and robustness throughout a product's lifecycle. Efforts to promote supply chain resilience should focus on the most critical product

The strengthening of risk-based approach to GMDP inspections and QP oversight was further supported by a couple of stakeholders. This includes training on modern manufacturing technologies and ICH Q12 principles. It was suggested that references made to China and India could be replaced by a focus on risk-based assessment for supply chain requirements.

The reliance of India and China as major sources of generic medicines, biosimilars and API's was mentioned by two stakeholders, that also commented that it will be crucial to bring significant critical API and finished dosage form manufacturing back to Europe to reduce dependence.

In addition to the comments reflected above, a number of individual comments relating to the question of whether the objectives meet the challenges are listed were submitted during the consultation. These comments are listed in **Annex 1**.

3.3.5.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

A small number of respondents from **clusters 1 (individual members of the public/patients), 3 (research)** and **4 (public body)** provided heterogenous comments on the theme.

Nearly a quarter of respondents in **clusters 2 (healthcare professionals)** (n=7) provided comments, mostly diverse in nature. However, the importance to have close monitoring of the entire supply chain, securing product security and traceability issues was pointed out by several stakeholders.

A third of the respondents in **cluster 5 (Industry)** (n=17) provided input on theme 5. Many commented that supply chain resilience will require supportive regulatory agility, and the regulatory flexibility agreed during COVID -19 for supply of crucial medicines would provide a good basis for further progress in this area. It was also noted that the lessons learned from the pandemic are still emerging, and further considerations will be needed around measures to promote supply chain resilience. It was also recommended that the network should work for adequate legislation to ensure emergency imports in the case of shortages. A universal EU-pack would allow for the swift movement of a surplus.

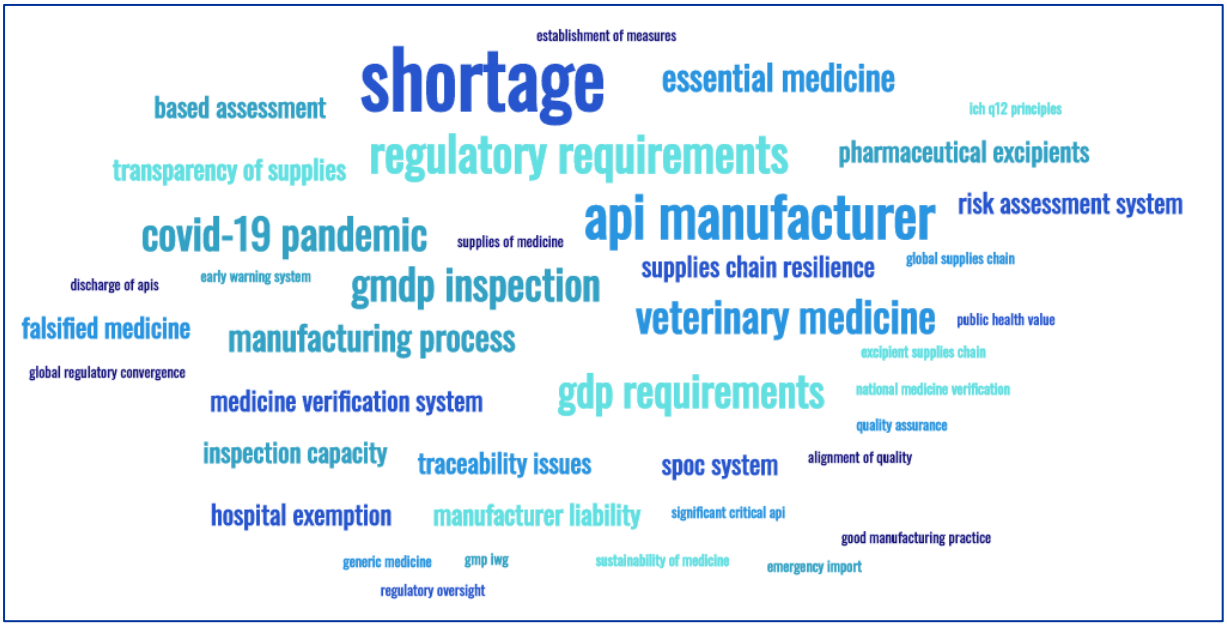
Several stakeholders pointed out that HMA/EMA should consider the introduction of protocol models to qualify suppliers and a risk-based approach based on prior knowledge. Comments were also made that the efforts to harmonise international standards such as GDP requirements for quality and safety should be made through (ICH), and regulatory agencies need to devote more resources to GMP inspections in less regulated countries especially for API

A couple of respondents suggested that a revision of the current variation legislation is needed.

It was also stated that the transparency on manufacturing and supply chain requires the successful implementation of relevant ongoing IT projects, and that the strategy needs to be closely linked to the network's Telematics Strategy.

The individual comments relating to the question of whether there any other challenges that should be addressed by the EMA/HMA network in this area are listed in **Annex 1**.

Figure 11. *Top key words from feedback for Supply chain challenges*



3.3.6. Responses per Strategic focus area: Sustainability of the Network and operational excellence

3.3.6.1. Question 6 Question 6: Do the objectives adequately address the challenges ahead?

In relation to the question of whether the objectives in the strategy adequately meet the outlined challenges, there were no overlaps in the comments provided by **clusters 1 (individual members of the public/patients)**, **2 (healthcare professionals), 3 (research) and 4 (public body)**.

As for **cluster 5 (Industry),** more than one stakeholder requested more concrete actions in relation to how a sustainable funding of the Network can be supporter. In addition, more than one industry stakeholder pointed out that a modernisation of the processes relating to scientific advice is needed.

The individual comments relating to the question of whether the objectives meet the challenges are listed in **Annex 1**.

3.3.6.2. Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

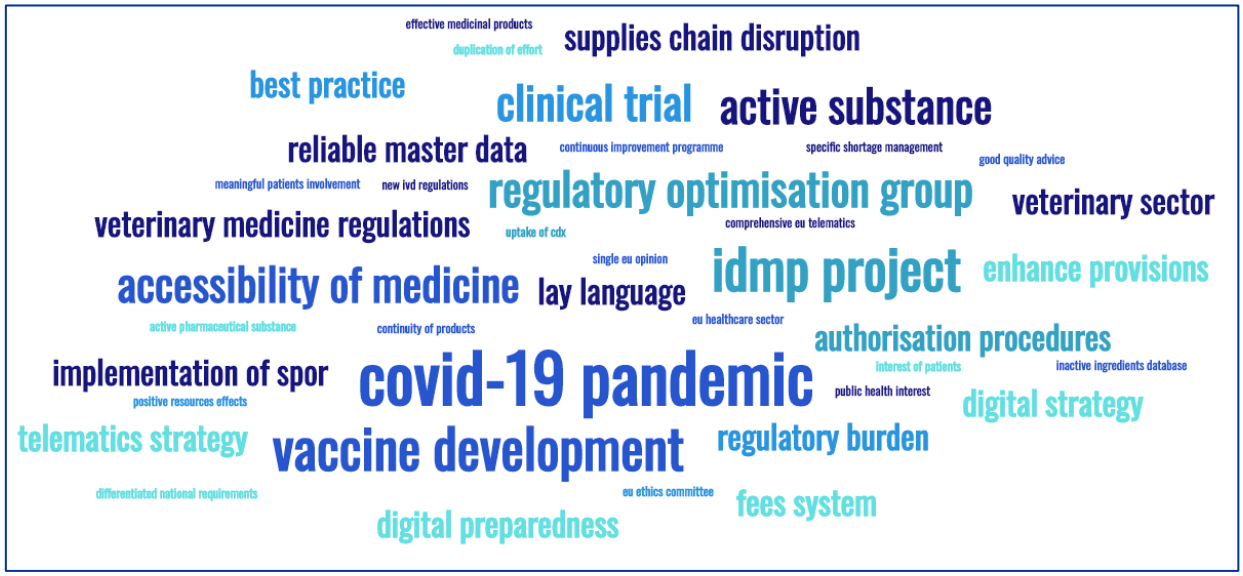
No comments were received from **2 (healthcare professionals) and 3 (research)** as majority indicated that there were no other challenges that should be address by EMA/HMA Network in this area**.**

There were no overlaps in the comments provided by the stakeholders within **clusters 1 (individual members of the public/patients) and 4 (public body)**.

As for the stakeholders within **cluster 5 (industry)**, more than one stakeholder pointed out a number of issues. First, the implementation of SPOR/IDMP/TOM is articulated as a challenge the Network needs to overcome due to the importance of the telematics projects. Second, the lack of funding for telematics projects is a challenge that needs to be addressed. Third, it is a challenge that the digital preparedness of the NCAs differ too much. Fourth, a number of industry stakeholders encourage ROG to resume the group's activities

The individual comments relating to the question of whether there any other challenges that should be addressed by the EMA/HMA network in this area are listed in **Annex 1**.

Figure 12. *Top key words from feedback for Sustainability of the Network and operational excellence*



4. Discussion

Based on the comments received during the public consultation, it is the overall impression that the joint Network strategy has been well-received across the cluster groups (cf. figure 3 on page 6). More specifically, stakeholders acknowledge that the strategy and the goals proposed are of significant importance. The fact that there were few areas identified as missing suggests that the strategy is a rational plan for progress in the coming 5 years.

A diverse amount of comments was gathered from the public consultation which have led to an array of changes in the final strategy document. These are further discussed within this section, focusing on how comments received have affected the content of the final strategy. The discussion is divided into two parts. In the first part, some overall reflections on the comments that, while of interest, have not led to amendments of the strategy are presented. In the second part, we discuss some of the other comments in more detail, mostly where these have led to amendments of the strategy.

4.1. Overall reflection on comments that have not led to amendments of the strategy document

A big proportion of the comments received encouraged the authors to provide more detailed considerations on issues covered, particularly for certain strategic theme areas. Even though many of the raised points are relevant, e.g. references to specific digital tools, questions in relation to the impact of the strategy on specific groups etc., the scope of the considerations was deemed too granular to be included in a high-level strategy.

In addition, many of the individual comments received relate to the implementation of the strategy, e.g. concrete proposals on how to meet the challenge of competence building, how to involve stakeholders in the implementation phase, definitions of key terms, funding and measurable outcomes etc. These comments will not be reflected in the high-level strategy but will be taken into consideration during the implementation phase.

As the strategy will be a living document and hence within the next five years will be altered with the changing environment, further lessons learned from the pandemics will be considered, both as adjustments to the strategy but particularly in the future planning steps.

Finally, a large majority of suggestions and identified areas, although related to the activities of the Network, were seen as outside its remit or could be more addressed through the Pharmaceutical Strategy for Europe being developed by the European Commission. These included actions related to: pricing and reimbursement landscape; affordability issues related to availability and accessibility of medicines; stockpiling of medicines within the supply chain. However, these particular actions will be included in the future implementation plans to provide synergies with the actions developed under the Pharmaceutical Strategy. Other initiatives have been emphasised in the strategy as facilitators to solve some of the challenges highlighted, for example the proposed EU Regulation on HTA, but are ultimately out of the EMRN remit.

4.2. Amendments of the strategy document based on the comments received

Section 3.1 on accessibility and availability of medicines received the highest number of comments with **a total of 118**, with a large majority supporting the goals and objectives included in the strategy to cover this strategic focus area. Some of the homogeneous recommendations provided by stakeholders have led to changes within this particular section and also amendments to relevant goals and objectives. A few of the proposals raised were more related to other strategic focus areas and have led to changes in the relevant sections of the document, for example the suggestion for EU regulators to contribute towards global regulatory convergence.

Within the first goal, a reference to low volume products was included to address the comments received with regards to the omission of paediatric medicines. The second goal within this strategic theme area was amended to clarify that it covers all types of medicines. Several stakeholders highlighted that the legislative changes for the implementation of ePI should not solely be restricted to newly authorised medicines and thus the mention of such medicines was removed. All stakeholders, including healthcare professionals and veterinarians, were emphasized in the strategy as key enablers to assure appropriate communication of availability and accessibility issues as well as medicines shortages across the lifecycle.

A number of stakeholders stressed the need for increased transparency in the manufacturing and distribution chain of authorised medicines. Consequently, the strategy further clarifies that improved transparency on the marketing status would allow regulators to better monitor the supply chain and anticipate potential issues with the supply of critical products. This in turn would also help manufacturers better understand their expectations around transparency related to the monitoring of the supply chain and also be helpful for HTA bodies.

One recommendation suggested by a number of participants was the creations of a list of critical medicines or essential medicines adapted for the EU. However, since not all medicines are authorised and marketed in all MSs, is it difficult to establish a list of common critical medicines for the EU. Nevertheless, in order to ensure availability of critical medicines in EU/EEA, an objective was further expanded to underline EMA's role in coordinating the activities of EMRN to monitor and coordinate medicines' availability and supply. The EMRN will review the shortages reporting process in the EU and European Commission study on root causes of shortages will also help identify other areas where changes to EU or national legislation may be required. Moreover, the centralisation role of the EMA would ensure better EU health threat preparedness as seen from the COVID-19 experience.

The use of repurposing medicines was seen as one of the crucial measures during the COVID-19 crisis and a few stakeholders supported that these measures are extended beyond COVID-19. Consequently, the strategy now states that repurposing of medicines should be considered beyond a crisis situation to support affordability of medicines.

A number of contributors highlighted the lack of focus on the veterinary medicines. Thus, a clear statement was included to assure that successful existing initiatives seeking to improve availability of veterinary medicines, including vaccines, that go beyond the requirements of the veterinary medicines' regulation will continue.

While the objective to promote the availability and support uptake of biosimilars in healthcare systems was seen differently across stakeholders, it was highlighted that there is a need to improve communication on biosimilars and create specific educational programs for healthcare professionals and patients. Therefore, this objective was readjusted to further focus on increasing awareness for such stakeholders to facilitate the uptake of biosimilars in healthcare systems.

Although EMVS was recommended as a solution for the monitoring of medicine shortages by a few stakeholders, the authors found that the system set out by EU falsified medicines legislation is not an appropriate tool to monitor shortages. The need to develop an IT tool to track shortages is already covered in the strategy.

A total of **85 responses** were received regarding section **3.2 data analytics, digital tools and digital transformation**. A number of the comments have led to amendments of the draft strategy. E.g., based on the received feedback, it is evident that it is unclear in the draft strategy that the section applies equally to veterinary and human medicines. Thus, a number of the respondents emphasise that there is a distortion in the prominence of the two areas with too much emphasis on the latter. That one of the five strategic goals *("Map the use and needs of data analytics for veterinary medicines and support a streamlined approach across borders within the EEA")* only relates to veterinary medicines underpins the perception that the remainder of the section applies to human medicines only. Consequently, the goal has been deleted and it has been underlined that the remaining four goals apply to both veterinary and human medicines.

Furthermore, a number of respondents – across the clusters of stakeholders – have expressed concerns about a perceived paradigm shift from emphasis on pre-approval activities to an emphasis on post-approval activities in the approval procedures. In continuation hereof, it has been clarified in the final strategy that clinical trials remain the foundational method of establishing the safety and effectiveness of medicines during the pre-authorisation phase and that new digital techniques have the potential to *complement* these.

Comments relating to the importance of openness, access to data and transparency were also articulated by stakeholders across the clusters. The highlighting of these aspects of the proposed digital transformation is in line with the agencies' emphasis on data ethics. Thus, it has been underlined in the final strategy that "openness, access to data and transparency" are key elements in relation to ensuring a high level of data ethics. In addition, it is now clearly stated in the strategy that clear guidelines for collecting and storing data at patient level are needed.

Furthermore, it has been emphasised by a number of stakeholders that the development of (pan-European) standards for real-world data (RWD) should be part of the strategy. Common standards for RWD would indeed constitute a great leap forward, but it is deemed unrealistic to obtain such common standards within the strategy period. In continuation hereof, it has been articulated in the strategy that the agencies will strive to enhance the level of standardisation of RWD in the coming five years.

Also, a number of comments relating to how GDPR requirements will affect the realisation of the strategic goals have been received. Thus, some of the respondents believe that GDPR requirements

constitutes an obstacle to the realisation of the potential of the digital transformation. The agencies do not share the interpretation that the GDPR requirements constitute a barrier in itself but recognise that a uniform application of the requirements within the Network is a necessity for an efficient implementation of the strategic goals. Consequently, it is underlined in the final strategy that GDPR requirements have to be applied in a uniform manner within the Network.

A number of stakeholders have highlighted that the issue of modelling & simulation is missing in the draft strategy. These concerns have been accommodated. Thus, a paragraph on the pivotal role of modelling and simulation has been added to the final strategy.

Furthermore, a lack of a paediatric perspective in the strategy has been emphasised by some of the stakeholders, though one of the expected gains from enhancing the Network's data analytics capabilities is the possibility to include subgroup perspectives such as paediatric, pregnant women etc. Consequently, this point has been articulated in a more direct manner in the final strategy.

Moreover, a number of the comments relate to the importance of international collaborations. The agencies are fully aware that the Network cannot implement the strategic goals in isolation. Thus, it is one of the objectives in the draft strategy to collaborate with international initiatives on big data. Based on the comments, further elaboration on the issue has been included in the final strategy though. Furthermore, the objective has been expanded to include collaborations with external stakeholders in general (including patients, academia, NGOs and industry) and with international regulatory authorities.

Finally, a number of respondents have highlighted the interdependencies between the strategy and the *European Health Data Space* (EHDS) initiative as well as the work of the Commission's high-level group on AI. The latter has been added to the list of existing initiatives will be considered in the planning. As for EHDS, the overlaps between the initiative and the strategy have been further elaborated on.

As for section **3.3 Innovation,** a total of 100 responses were received. Several comments pointed to the need to not limit innovation to new medicines and to also consider the off-patent sector and new or improved clinical use of older molecules and new (digital) technologies. Although the text already covers the need to promote innovation throughout the product lifecycle, and a reference to the repurposing project STAMP is included under the interdependencies of the Innovation section, a more concrete reference has also been included in the text of this section to make clearer the support from the Network: '*supporting the repurposing of existing medicines for new indications in areas of unmet medical need*'.

Some comments also stressed the importance of patient involvement. This is in the spirit of the overall strategy however a more concrete reference was included in the text of this section: *Appropriate engagement with patients will be needed during product development and throughout the lifecycle to ensure a patient-centred focus while protecting public health and availability of medicines.*

Several comments requested the strategy to elaborate further on comparative and new clinical trial designs and to include the implementation of the clinical trial regulation as a strategic goal. The focus on novel clinical trials is already acknowledged in the strategy document, not only with a specific objective under goal 2 – Foster innovation in clinical trials and develop the regulatory framework for emerging clinical data generation – but also with several references throughout the text which detail the need to explore new clinical trial designs that facilitate the generation of valid evidence for decision-making in different settings. It is considered that the particular interest in real-world data explained in section 3.2 addresses the request to bring the comparative component into perspective in the pre-authorisation phase. In relation to the implementation of the EU legislation on clinical trials,

this is already a mandatory obligation and thus has been incorporated into the interdependencies section.

A number of comments pointed to the need to focus research on public health needs, with several comments calling for additional focus on pediatrics. Throughout the text, specific mention is made of the need to promote the research and development of new therapies for vulnerable subgroups, particularly the pediatric population, with a specific objective under goal 2 covering *investment in special population initiatives*.

Some comments asked to better explain how the collaboration with notified bodies responsible for certification of medical devices is foreseen. Due to the high-level nature of the strategy document such details are not included. However, the request is well noted and will require further discussion as part of the implementation phase of the strategy. Nonetheless, the need to improve the collaboration in relation to combined products has been clearly stated with the expansion of one of the objectives in goal 4. – Increase collaboration with Medical Device Authorities *and Notified Bodies, exchange knowledge and facilitate collaboration and sharing of expertise to ensure effective and appropriate regulation of combination products*.

The relevance of research groups, start-ups and SMEs as innovative drivers has also been stressed in a number of comments and collaboration with SMEs from early stages of development has been included within the text and goal 4 - Enhance collaboration with *other stakeholders* including medical device experts, notified bodies, *SMEs and research*/academic groups.

Furthermore, five additional interdependencies have been identified in this section to address comments received, namely the regulations on in-vitro diagnostics, clinical trials and veterinary medicines. A more prominent reference to international collaborations, including the International Coalition of Medicines Regulatory Authorities (ICMRA) was also introduced together with new references to the Clinical Trials Facilitation Group (CTFG) and the European Reference Networks (ERNs).

Finally, the objectives included in the annex of the strategy document have been reviewed considering comments received to imprint further focus on key priorities, with some objectives converted into concrete actions to be covered in the implementation phase. In particular, the rewording of some objectives has further emphasized the integration of scientific and technological progress and the need for increasing awareness of regulatory requirements to facilitate the translation of research into medicines development and ultimately into clinical practice and patient treatments. In parallel, new references to the collaboration with notified bodies and early interaction with researchers and SMEs have been introduced.

Out of the **61 responses to this section 3.4 Antimicrobial resistance and other emerging health threats**, many referred to requests for further details or topics that are out of scope for this high-level strategy and that will be dealt with during the implementation phase. A number of comments received were also not within the scope for this section and have been directed to the appropriate focus area.

It was suggested that a paediatric approach should be applied in the strategy as a whole; however, this is considered more appropriate in other sections of the strategy and no changes have been made in the AMR section. The goals and objects of this focus has been updated in line with comments received, making them more stringent and clearly stated to include both human and veterinary fields where appropriate.

A suggestion was made to differentiate between antibiotic, antimicrobial and antiparasitic resistance in the strategy. However, following another suggestion the definition used for AMR in the strategy has been aligned to the suggested definition by the European Commission, including antifungals, antivirals

and antiparasitic. In general, "AMR" will be used in the strategy, to be prepared for broader coverage of resistance and infectious diseases. This is in line with the current emphasis on the area of anti-infective by the European Commission, in which antibiotics and antituberculotics pose the main problem/area of interest in the human area. The text has also been updated to reflect the importance of drug-resistant forms of tuberculosis in fighting AMR.

Comments made on items covered by the new veterinary legislation falls under the remit of the European Commission and are to be handled during the implementation of that legislation. This includes the situation of off-label use of veterinary medicines, autogenous vaccines and the harmonisation of AMR relevant data. A suggestion was made to extend the goal to foster surveillance on the emergence of AMR to include also veterinary medicines. The surveillance of AMR in animals falls under the remit of EFSA, but the strategy objective on emergence of resistance in human medicine has been expanded to include also veterinary medicines. Also, the importance of taking the EU Farm to Fork strategy was highlighted in comments and a reference to this strategy as a driver has been added to the text.

Many comments focused on the need for a coherent and widely applied European-level policy in this area for European developers of new antibacterial agents, calling for new tools and new ways to reward developers. Though highly relevant, this consideration must be addressed at the political level and is out of the remit of the network. The need for new business models for antimicrobials was emphasised in several comments, including need for a root-cause analysis, incentives, prophylactic treatments etc. This has already been covered by the strategy and further details will be addressed in the implementation phase. However, many of these issues need to be addressed at a policy level including the EU Pharmaceutical Strategy.

The matter of international collaboration and pan-European coordination as essential for the area of AMR and vaccines have been brought forward in several comments. This is already covered in the strategy and further details will be handled in the implementation phase. Effective collaboration based on One Health Approach will be more visible and is strongly supported. The OIE has been added to the as suggested, as has a text clarifying that some of this work falls under the remit of the ECDC. The role of different professions in battling AMR is recognised, but training of these groups does not fall within the remit of the network and are therefore excluded from the strategy. Communication and collaboration, including communication with the public, will be covered during the implementation phase. The importance of vaccination and prevention are covered in the strategy and no further amendments will be made.

A number of comments were made indicating that innovative solutions are missing in the current strategy. The strategy´s focus is for the next 5 years which means a strong emphasis is placed on preserving what is currently available. Innovative solutions are mentioned in the strategy and considered to be prioritised in the longer term. Some comments on innovative or alternative solutions are also already covered by the section on responsible use of antimicrobials. Problems and issues concerning older products already on the market will be addressed during the implementation phase.

With regards to pharmaceuticals in the environment, this will also be addressed during the implementation phase. For clarity a reference to the European Commission will be added to the actions during the implementation phase, and a reference to environmental aspects of API production has been added to the strategy. Regarding environmental risk assessment both human and veterinary use is covered in the strategy, and further details will be handled in the implementation phase. An adjustment has been made in the text on ERA as suggested for further clarification.

For **Section 3.5 Supply chain challenges**, 63 responses were received. Stakeholder comments were supportive of the objectives and there was some alignment on the importance of the Strategic Goals, however stakeholders did not always agree on the objectives to achieve the strategic goals. A number

of comments made on this section did however not refer to the scope of the focus area and have been referred to the appropriate section. Furthermore, some of the comments were considered to already be covered by the current text in the strategy and thus resulted in no amendments. This includes comments on decentralised manufacturing technology developments, prevention of falsified medicines in the supply chain, lists of APIs in the EU and harmonization of post-approval changes. The need to investigate re-shoring of production has been highlighted in a couple responses, but was already covered in the strategy. The opinion that it is not the role of regulators to help support competitive EU-based manufacturing base able to implement Pharma 4.0 manufacturing models was voiced. However, regulators can support through development of appropriate guidelines. The regulators role is "through engagement in ICH and development and implementation of appropriate guidelines" where the final aim is the public interest.

Several comments were made on the inclusion of risk-assessment inspections and evaluations of manufacturers, and the importance of risk minimizing actions. It was also pointed out that efforts to promote supply chain resilience should focus on the most critical products. Risked based elements are included in the strategy and no further amendment resulting from these comments were deemed necessary. The need for transparency of the information around the supply chain was high-lighted by some, including the need for communication with the stakeholders. This has already been covered in the strategy. The continuation of the SPOC and iSPOC system was also mentioned in a few comments which will be addressed during the implementation phase.

A number of comments have led to amendments of the strategy. The lack of veterinary focus besides the new veterinary legislation has been addressed and amendments made to make the veterinary area more visible. The reference to review of current EU GDP guidelines have also been amended to include reference to the VICH. Reference to recommendation on autogenous vaccines have been included into the text. Comments received on the establishment of GMP rules for veterinary medicine have not been included as this fall under the implementation of the new veterinary legislation.

It was pointed out the excipients have not been sufficiently addressed, and a reference to excipients have been added when APIs are mentioned. A comment was also made that EU legislation does not address GMP and GDP for excipients, however this is not correct. It was also identified that actions on the environmental impact of pharmaceuticals are missing which has been rectified.

A few comments refer to the need for development of the regulatory framework, including demands on inspections, increase in micro-supply chains & distributed manufacture, harmonisation of GDP guidance, variations regulation, regulation on supply chain resilience and diversification. This is covered to some extent by the text, but amendments have also been made to reinforce the need to have adaptable regulatory framework to foster innovation and investment. The need for international cooperation and regulatory cooperation has also already been addressed. Several comments have pointed out the need to increase and enhance the inspection capacity, including utilising MRAs with other regulatory bodies, this has also already been covered in the strategy. Comments directly referring to changes to legislation is out of scope of this strategy and is in the remit of the European Commission and the Pharmaceutical strategy.

Some comments were made emphasising the need to implement on-going telematics projects as well as development of new IT based solutions in the network. A general overview of the strategy has been done to make sure the telematics aspects have been addressed, but for the most part this will be addressed during the implementation phase. Some comments were made on the need to adapt the supply chain with regards to the "connected patient", also addressing ATMPs and the hospital exemption. A new text on the connected patient and interdependencies has been added to the strategy.

Input was received from a total of 50 different stakeholders for **section 3.6 Sustainability of the Network and operational excellence.** A large majority of comments were deemed to have already been sufficiently addressed in the draft strategy, either addressed in other sections or phrased differently. Other comments were seen as not to fit the level of abstraction appropriate for the joint network strategy but were better placed in the accompanying implementation documents. Moreover, a few suggestions were of an insufficiently specific nature that did not fit with the overall purpose of strategy. On the other hand, a number of proposals also fell outside the scope of the strategy and thus were not taken into consideration.

5. Conclusion and next steps

The public consultation received a broad range of different stakeholders' feedback on all Themes as opposed to having a more predominant stakeholder group only focusing on a few specific Themes. The overall impression from stakeholders was good, with many finding the strategy promising as current challenges have been recognised and solutions to address them have been included in the plan. Nevertheless, there was an expectation that the strategy would include more detail on the concrete actions. A few stakeholders highlighted that if the proposed ideas can be implemented, this would be a big step forward to get better medicines to reach patients faster. However, they emphasised that all stakeholders need to collaborate and support the plan to make it a success.

As highlighted in section 4, some of the feedback received from the public consultation have been incorporated into the final draft joint network strategy document. The final document will be finalised and adopted by EMA Management Board and HMA by end of November with the aim to publish by end of 2020.

It is important to note that the joint strategy is intended to be a high-level overarching document that will guide the work of both the EMA and HMA for the next five years. Actions, timelines and measurable outcomes will be identified and included in EMA's multiannual work programme and HMA's Multiannual Work Plan (MAWP). Furthermore, a monitoring group may be set up to evaluate the delivery and implementation of the joint strategy. A progress report would be presented regularly to both the HMA and EMA Management Board. An overall review of the strategy will be conducted every 18 months to ensure that all goals and objectives are still applicable.

To conclude, the stakeholder views outlined in this paper are instrumental in further enhancing the European Medicines Agencies Network Strategy to 2025. We hope that the insights received from stakeholders and analysed in this paper will not only guide EMRN priorities, but also inform stakeholders' own positions on the important topics identified as priorities for the next five years.

Annex I: Summary of individual comments

In this annex we summarise the very rich feedback received in the format of individual comments. They are listed per question and per cluster group and should be seen in complementary to the overall summary included in sections 3.2.2.1. to 3.3.6.

Question 4: Are there any significant elements missing in this strategy? and 'Any other comments'

Cluster 1: Individual members of the public, patient or consumer organisations and advocacy groups (N=46)

Individual views suggested several areas where a clearer direction and further detail would be expected:

- Provide further information on medicines for COVID-19
- Expand capability with outsourced expertise
- Develop strategies for micro-supply chains and distributed manufacture for ATMPs
- Define a clear framework of what would be acceptable to the EMA in terms of decentralised trial designs
- Include systematic assessment and prevention of the risk of medication errors during the product lifecycle including prior the granting of marketing authorisation
- Foster implementation of clinical guidelines with scientific evidence
- Promote education and information to the general public through NCAs/ EMA
- Further elaborate on integration of qualitative data such as patient narratives
- Elaborate further on a long-term perspective including a paediatric view even if strategy itself is limited to a five-year period
- Prioritise Big data research
- Define what an acceptable evidence threshold for new medicines is
- Better monitor post-licensing studies and enforcement of evidence generation commitments
- Further outline specific measures to strengthen the EU pharmacovigilance framework

Cluster 2: Healthcare professionals and healthcare professional organisations (N=12)

An array of different views was provided by individual stakeholders within this group, including:

- Prescription rights for frontline healthcare nurses
- A clear focus to fight AMR
- A focus on vaccination and prevention, linking it to the nursing workforce and other healthcare professions
- Managing Parallel Trade and Product Shortages in the EU Markets
- A list of APIs being used in medicinal products in the EU should be made available
- Highlight RMM (Rapid Microbiological Methods) implementation in the strategy, particularly in light of COVID 19 and address guideline and policy changes for implementation for RMMs

- Governance in collaboration between EMA and manufacturers, innovators on drug and health services development and registration
- Impact of telehealth & telemedicine on post-approval follow-up
- It is necessary to treat these issues with a global view on safety; all relevant stakeholders should have a minimal structure related to safety management, a ""Safety Drug System"". The pharmacovigilance system is insufficient, we need a broader view on the safety of the medicinal products. There is also a need to improve the timely communication strategy related to drug and health product safety issues. The information that is received is as important as the information that is given.
- Excipients are not sufficiently addressed in the strategy
- Whilst the strategy highlights the need to support environmental sustainability and makes the link with the European Green Deal, it falls short of identifying actions that could address the environmental and climate change impact of pharmaceuticals
- The veterinary sector is often only addressed by a reference to the new regulation 2019/06, but no wider description or aspirations are given e.g. in the discussion around big data. A wider recognition and focus of the veterinary aspects would be nice
- Farmers training in relation to AMR should be considered
- The use of relevance tools when evaluating medicines should be applied (especially with regards to oncology)
- Harmonised implementation of GDPR is needed across Member States, especially in regard to clinical trials
- Simplified approval of off-label indications should be developed
- Clarification on how stakeholders can contribute in implementation of strategy is requested

Cluster 3: Research (N=23)

The following points were raised by the research stakeholders:

- Benefit-risk assessments of older medicines should be added to strategy
- Actions relating to international collaboration regarding AMR to be added to strategy
- No mention of computer modelling and simulation in section on data analytics
- Access to investigational drugs for life threatening diseases
- Ensuring the successful implementation of the Clinical Trial Regulation is missing in the strategy
- Specific attention should be paid to ensure a smooth and efficient implementation of the Regulation for ATMPs
- The hurdles due to the GMO legislation should be addressed more effectively in the strategy
- Greater convergence of requirements for hospital exemption, donor testing and eligibility requirements for blood, tissues and cells used as starting materials, ATMP classification, GMP implementation, etc. should be included in the strategy
- The possibility of using Master Files or having certification schemes for biological raw materials and for manufacturing-enabling technologies should be evaluated

- The possibility for patients to move cross-border for their treatment with new medicines should be addressed on the strategic focus area on availability and accessibility of medicines
- Centralisation of clinical trial management to avoid multiple smaller trials with the same drugs in the different MS should be addressed in the strategy
- Full spectrum "medicines" to be more recognized and available for research

Cluster 4: Public body (n=23)

Furthermore, the following points were raised by the public body stakeholders:

- The definition of "innovation" is missing and how exactly medicines in question improve the health of our society is not addressed in the strategy
- Better explanation of how the collaboration with notified bodies responsible for certification of medical devices is foreseen.
- Encourage PROM and/or PREM measurements during clinical trials in order to support evidence generation to the EMA and the downstream decision-makers.
- It is important to ensure that all post-licensing evidence is made available to the regulatory network to facilitate timely follow-up of benefit-risk by regulators, including where payers enter into 'managed entry' or 'pay-for-performance' agreements.
- It is not clear how collaboration with notified bodies responsible for the certification of medical devices is foreseen.

As additional comments appreciation for the strategy and the possibility to submit comments were expressed. Also, further clarification on ePI and tougher demands on new medicinal products were requested. It was also suggested that more cooperation with EU Agencies should be included and that the environmental expertise in the network as well as the position of the ERA should be strengthened.

Cluster 5: Pharmaceutical industry (trade association, individual company, SME) (N=31)

The following supplementary individual comments were provided by specific stakeholders:

- Relevance of start-ups and SMEs as innovative drivers should be stressed more in innovation and medicine/therapy development
- Further clarity on links with other EU initiatives i.e. how European Health Data Space relates to DARWIN in Big Data Task Force and any specific areas of collaboration with EUnetHTA as the key pan-EU HTA network
- Attractiveness of Europe regarding innovative products such as (combined)-ATMPs, combined Medicinal products & CDx, combination products and microbiome-based products
- Protection of incentives in place for orphan drugs OD and paediatrics
- New economic model proposed for products demonstrating an insufficient return on investment
- Health Data ownership, valorisation and usage in clinical trials, especially using in-silico technologies
- Clarification of the HTA Regulation proposal and propositions for transparency and mutual recognition
- Legislative amendments are not foreseen i.e. extension of applicability of Article 126a of the Directive would increase availability of adequate amounts of medicinal products at affordable prices for all patients in EU if available in one EU MS

- AMR focus on traditional (non-inferior) antibacterial agents, misses innovative solutions i.e. major changes in guidelines, inclusion of non-traditional anti-infective solutions, boosting combinations of multiple agents, and aiming for superiority
- The importance of striking a better balance between curative treatments and preventative care and propose that this should be reflected in the fundament of the strategy. Support for traditional and complementary medicines should be included so that the full potential of these products be further explored and exploited, not overlooked
- A coherent and widely applied European-level policy in this area for European developers of new Antibacterial agents (ABAs)
- A temporary way to reward new technologies outside of hospital reimbursement schemes for ABA developing SMEs, such as NTAP for New Technology Add-on Payment in US.(EMA) implement a regular and long-term dialog between the ABA developers and its regulators to propose how such procedures could safely be streamlined. This committee should also examine the appropriateness of implementing tools, such as QDIP (QIDP = Qualified Infectious Disease Product, an idea from the US GAIN Act)
- (Global) lack of harmonization of post approval changes and the impact of that on supply chain management and access should be added to the strategy
- A discussion on the concept of Dynamic Regulatory Assessment. This is a concept that has evolved recently and component parts with various names such as 'cloud-based submissions', 'rolling reviews' and 'continuum of evidence generation' have been used in this context.
- Tools to identify and qualify new digital endpoints
- More details should be provided on how the goals and objectives will relate to post regulatory review decisions (e.g. HTA/payer, will the HTA bodies also upscale in terms of IT infrastructure and personnel skills in data science and technology to match the regulators? How will the tools the network is planning on creating (such as DARWIN) benefit HTA bodies/payers?)
- In addition, cross border data flows and interoperability as called out by the Commission within the European strategy for data should have a greater focus
- Stronger focus on the importance of diagnostics and the value of rapid diagnostic testing with regards to overall stewardship should be considered
- An increased European contribution to the global resource 'plasma' is needed and should be addressed by relevant policies - growing reliance on plasma from the U.S
- Formal Patient Access Challenges to PDMPs need to be addressed due to different reimbursement schemes in different MSs
- Important to strengthen supply in EU from European based manufacturers of antimicrobials
- More financial support for EU pharmaceutical players
- Expanding capacity and innovative manufacturing processes and technologies
- Importance for EU industry to establish inspection outside EU
- Enforce same regulatory standard offshore as in Europe. Today the quality concern is relevant
- Off-patent medicines (specifically biosimilars) as a widely recognized tool to increase patient access to medicines are not enough covered

- Supportive of the ambition of the EMNR to facilitate the development of innovative medicinal products to address unmet medical needs – Theme 1
- A paper published recently by the independent Review on Antimicrobial Resistance.
- Need for alignment between global regulators and continuity from vaccine discovery to market access and life cycle management – Theme 3/6
- Patient perspective should be included in well-structured Benefit Risk Assessments
- Research of key EU projects such as IMI PREFER and IMI Paradigm should be considered
- Progress on virtual / remote CTs, use of digital and non-digital biomarkers and complex clinical trial designs in development of precision medicine need a consistent and predictable Regulatory environment
- HMAs could also foster ATMP trial conduct by supporting EU harmonisation of GMO Requirements
- Tailored approaches for value added generics (with new formulations, dosages, innovative presentations) are needed to incentivise this type of innovation, such as the development of accelerated assessment pathways, including further use of real-world evidence
- EMRN could be more open to also learning and adopting practices from ex-EU regulatory systems
- Global collaboration to facilitate and oversee the rapid development and approval of treatments and vaccines, particularly in response to Covid-19 pandemic
- Important contributions from the various sub-groups of HMA (EU-IN, CTFG, ROG, Big Data) are not optimally reflected
- Many aspects of the innovative biotechnology supply chain differ from conventional pharmaceuticals and require close proximity to patients, highly specialised manufacturing, and physicians/hospitals to administer care. Much of this relevant manufacturing exists in the EU, or is in the process of being established here, but this requires intensive capital investment
- Research and development of innovative biologicals requires significant resources and is best encouraged by a value-based system to reward innovation
- To facilitate EU manufacturing, the EMRN and inspectorate needs to prepare for manufacturing sites handling multiple types of biotechnology products (biologicals, ATMPs)
- Harmonization of the EU Regulatory Network has been improving, national regulatory approaches that pertain to national competencies still differ, leading to fragmentation and increased complexity for developers. This fragmentation is, even more, a challenge when dismissing an EMA scientific advice or decisions (e.g. CAT and ATMP classification, OD, PIP, early access)
- Complex products including GMOs are challenged: facilitating single approval covering GMO aspects would help EU's attractiveness
- A harmonized approach / structured governance will guarantee effective collaboration between the EMRN, NB, and EC responsible for regulating medical devices and IVDs. Clear guidelines are needed before the applicability of the MDR
- Expedited pathways for assessing quality data needs to be designed as could often lead to delay in the registration of the innovative products despite showing compelling efficacy/safety.

- A specific Veterinary Network Strategy, to reflect the specificity of the veterinary environment or a separate section in the strategy for those activities that are specifically for the veterinary sector with a separate veterinary stakeholder meeting would be beneficial
- For the implementation of the strategy it is key that the necessary resources at EMA and national agencies are available to implement secondary legislation for Regulation 2019/6 and have databases and additional guidance in place in time and training of assessors in the member states
- Missing within the strategy is an appropriate focus and emphasis on the importance of theme relevant to access of OTC medicines
- It is important to enhance the availability of OTC medicines on the market by developing clearer and simplified processes for change of legal status, from prescription to non-prescription and this strategic objective includes in previous network strategy should remain
- Sharing of best practices across the network with regards to switches of legal status from prescription to non-prescription medicines and successful self-care practices should take place. CMDh non-prescription medicinal products TF is a key enabler and should be mentioned.
- Application of the +1 year data protection should also apply to reward innovative switches
- Advocate inclusion of non-prescription medicines use in personal health records/ pharmacy records
- Concept of multi-stakeholder scientific advice (SA) with CHMP, CMDh, national representatives, patients/consumers, pharmacists should become a reality, as it would allow a company to discuss data and the feasibility to switch
- Increased focus drug development for orphan diseases
- Increased focus data analytics and digital transformation in healthcare
- Lack of strategic and holistic approach to support the short/ mid/ long term development and access to off-patent medicines as an integral part of the lifecycle of innovation
- More international/ global perspective to development of future off-patent medicines. The strategic objective should be to facilitate a single development of follow-on products to avoid redundancies of trials and better access to generic and biosimilar medicines worldwide.
- Global harmonisation efforts can provide synergies in assessment of New Medical entities, e.g. through closer collaboration with ICMRA

Strategic focus area: Accessibility and availability of medicines

Question 6: Do the objectives adequately address the challenges ahead?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- National EU regulatory agency websites need to be improved and would benefit patients in easily accessing information. Harmonised standards for each national website should be set or HMA website to be use as a central website with links to national website for national issues.
- EU projects must be planned rigorously, and delivery timelines must be adhered to other than in very exceptional circumstances
- There is a need to address the fact that that the protectionism stances of China and the US could soon challenge the trade policies of pharmaceuticals from China to the EU
- Horizon Scanning will identify anything that is not clear. There is going to be an increase in distributed/decentralised manufacture which will result in an increase in micro-supply chains.
- Consider that a patient-centred pharma policy should first focus on a better scientific evidence generation before the marketing authorisation
- Covid-19 pandemic illustrated the need for the conduct of large, well-designed, randomised clinical trials, which are the only way to provide robust data for drug evaluation, decision-making and clinical practice
- Medicines that address unmet medical needs should have a proven added therapeutic value to the standard treatment based on patient relevant endpoints. These should have broader and earlier access coverage after an optimised evaluation between medicines regulators and other decision makers.
- Restrictive measures can increase the risk of research being discontinued, i.e. prices are too high
- New innovative therapies, approved, and which are less toxic for liver patients
- Publish new EU guidance elaborating on cases when free movement of medicines may be restricted in order to prevent and address medicine shortages
- Demand systematic collection and submission of real-world evidence (including overall survival, adverse reactions and quality-of-life improvements) once the medicine enters the market and its timely re-assessment, where appropriate
- Define the lowest prices of the listed medicines for whole EMA space
- Establish the system of co-financing the cost by agreement between the drug manufacturers, EU – represented by EMA and local level (at EU states level) for all countries in East
- Compensating/counteracting the undesirable impact of Orphan drug pricing on these orphan states
- An increased transparency on the marketing status of CAPs; as well as actions that would increase access to the best therapeutic options and innovative medicines

- Address antibiotic shortages in global discussions as part of the EU's external policies: shortages problem can be addressed in the development of new antibiotics through requiring a diverse Active Pharmaceutical Ingredients (API) base, providing pooled or joint procurement, and rethinking the economic models
- EMRN members are only one step in the process. Constrained budgets and political pressures lead to vast inequalities in access to medicines and continually evolving and improving the regulatory environment is not enough on its own
- Require pharmaceutical companies to submit prevention plans to help identify risks early on and promote mitigation measures
- Strengthen the SPOC system and draw lessons from initiatives put in place during the COVID-19 pandemic (e.g. i-SPOC)
- EMA's catalogue should become a comprehensive, user-friendly public pan-European database connected to national ones
- Paediatric perspective is largely missing.
- Post-authorization evidence and safety data is especially important for children.
- Patients with rare diseases (such as paediatric cancer patients) should participate in trials with highest possible benefit addressing the most important unmet needs. This requires both prioritization, collaboration and coordination within Europe to recruit enough paediatric patients when developing precision medicine.
- Ethical aspects in the area of clinical trials are very different when it comes to children.
- To organize lessons learned from off-label use is especially important for paediatric childhood patients.
- Disclose information about which drugs are still not available to children in each country despite a high unmet need and access in the adult population to put pressure on the pharmaceutical companies to accelerate development for children.
- Develop effective and accessible research infrastructures, particularly in the field of rare diseases such as paediatric cancer. Special focus is needed to harmonize medicolegal issues across borders and to support and strengthen European clinical trial units.
- Offer patients, researchers, companies and academics an overview of on-going early clinical trials across Europe including paediatric trials.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Strategy should address the role of general care nursing prescribing medicines
- Agree that there is a need to increase transparency and overview of the marketing status of centrally authorised medicines.
- EMA should be empowered and provided with sufficient capacity to monitor and coordinate medicines' availability and supply.
- EU can contribute to ensuring equal access to medicines in all Member States by subjecting the granting of the marketing authorisation to a commitment on the part of pharmaceutical companies that once authorised, medicinal products will be launched in all EU countries at the same time.

- To increase the EU's resilience to external emergencies, stockpiling of medicines within the supply chain and at EU level under coordination of an EU agency allowing for targeted interventions.
- Increasing availability of medicines through optimisation of regulatory path, including evidence planning
- Revisions of the procedures for accelerated medicines' development, new means of their assessments, and fast approval and market access must be undertaken cautiously to adequately take patient benefit and safety aspects into consideration.
- Importance of pharmaceutical excipients (excipients) is not explicitly recognised. Support to their production in the EU / EEA should be a focus area.
- EU / EEA legislation does not address minimum expectations for GMP and GDP required for pharmaceutical excipients. Adoption or acknowledgement of guidelines developed by associations would assist the establishment and maintenance of appropriate quality standards.
- No regulatory platform for the approval of novel excipients independent of the Marketing Authorisation Application (MAA). Establishing an equivalent platform for novel excipients could help to provide innovative and safe excipients for improving medicines for European patients with sufficient IP protection for novel excipient developers in the EU / EAA.
- Parallel trade has been a neglected root cause and some stakeholder claim is it only a solution.
- Suggest using Cochrane methodology to support the best multi-disciplinary guidelines on all areas of urological care, including the most up to date information on treatments.
- Remove national barriers for approval of clinical trials and put in place an EU regulation to ensure CT approval at EU level so that not only borderline products are accepted by certain agencies across EU.
- Core mission of EMA and availability and accessibility issues are also extremely important in veterinary medicine.
- Clearly mention that vaccines are included when talking about medicines and it is important to mention that the task force on availability of veterinary vaccines will continue.
- For veterinary medicines and availability, it would be good to also mention the role the Union Product Database will play in this as will allow to see where products are authorised and also were shortages are.
- Include reference regarding importance to develop rapid vaccines and medicines to fight emerging diseases (some of which could be zoonotic) in animals.
- Consider the extension of veterinary medical product classes.
- Support in particular its objective to provide adequate regulatory responses to the identified root causes of medicines shortages. Recommend EMA and HMA to explore ongoing best practices in the reporting of signals of shortages by different actors in the supply chain.
- It is believed the European Medicines Verification system set out by the EU falsified medicines legislation is not an appropriate tool to monitor shortages.
- Suggest to make use of pharmacy-based reporting systems already in place in many countries guaranteeing harmonization of criteria and comparability of data, which should take into account differences in definition of a medicine shortage across borders.

- Supports the principle that ePI complements the use of paper package leaflets, and that it does not intend to remove or substitute the currently available paper format. Ensure that there will be no abuse of higher flexibility for ePI in cases of shortages resulting in a wider replacement of paper package leaflets.
- Explore a pan-European database of patient information leaflets / summaries of product characteristics translated into national languages. Paper patient leaflet ('PL') or primary packaging could consequently include a statement directing to the electronic product information available.
- Strongly encourage national authorities to implement the principles defined in the EMA/HMA good practice guidance for communication to the public on medicines' availability issues where this is still needed.
- Welcome the focus of the strategic theme area on the coordination between regulatory policies with other policies which might affect the availability of medicines across Europe.
- Request the EMA/HMA to define critical medicines not only as those that are required in times of crises (e.g., pandemics), but also those that are necessary for the diseases where adherence to treatment is crucial in order to see a benefit, e.g., cancer. Use the WHO Model Lists of Essential Medicines Lists (EML) as a starting point.
- ESMO has created a tool called the ESMO-Magnitude of Clinical Benefit Scale (ESMO-MCBS) and the tool could be useful in assessing the magnitude of benefit of an anti-cancer medicine during the approval process.
- Supports the objective to promote the availability and the uptake of biosimilars in healthcare systems.

Cluster 3 (research):

- Specific actions should be put in place to reassure the quality of data at the source.
- Strategy should include the development of mechanisms for quality surveillance.
- Children need to have efficacy and safe medicines and to receive on time the advanced therapies and innovative treatments.
- Scope to focus on pricing and reimbursement (P&R) procedures.
- Strengthening collaboration with the HTA bodies is important orientation. Harmonisation of HTA assessment would contribute to improve a swifter and fairer access to innovative therapies across Europe.
- Welcome the mention of repurposing medicines, as this is especially needed in the field of paediatric cancers (e.g. medicines with original adult indications).
- For countering shortages, to add that importance of transparent information exchange on medicine stocks available in each country.
- Paradox between regulator's approaches in providing early access to ATMPs for patients' benefit and HTA/payers' reluctance to provide access until the long-term profile has been fully characterised needs to be addressed.
- To address the availability and accessibility of medicines, it is important to ensure that there is sufficient attention devoted to disease areas that are not commercially attractive and that alternative (non-pharma) models for development, procurement and financing of these medicines are considered.

- A focus on ensuring global access to medicines for poverty-related and neglected diseases (PRNDs) as well as new antimicrobials - goods that lack market incentives and thus, are particularly prone to shortages.
- To highlight the tangible benefits delivered by public-private product development partnerships (PDPs) which work to develop and provide access to new drugs, vaccines, diagnostics, and devices in areas that lack commercial incentives, such as infectious diseases and antimicrobials. This could ensure that medicines are affordable in low- and middle-income countries.
- Specific mention of antibiotics and include information about the different causes of availability and accessibility for these medicines.
- In order to optimize the development of medicines and produce better scientific evidence, the EMA must put innovation in humane nonclinical safety and efficacy assessment at the heart of the strategy and promote a move away from the use of animal-based testing methods, which are costly, time consuming, unethical and unreliable.

Cluster 4 (public body):

- Healthcare professionals (doctors and veterinarians) and patients may play a role as stakeholders as the last links in the chain and may influence the market by their prescribing behaviour/ recommended treatments or by their purchase behaviour.
- Strong alignment with the new EFSA Strategy 2027.
- It's important that post-licensing evidence is shared between regulators, HTA bodies and payers as much as possible to reduce uncertainties in decisions.
- It's also important that methods are developed for using the post-licensing evidence in order to raise the quality of the evidence and make it easier to use in decisions.
- The agencies' concern to reduce access time or requirements to new drugs at the regulatory level could lead to a reduction in the guarantees of incremental clinical benefit for patients. This would increase uncertainty at the level of decision-making about reimbursement and have the general adverse effect of reducing the accessibility as insufficient evidence, together with high prices, is a main barrier.
- Patient accessibility to medicines should be considered in a broader perspective (not only regulatory) and consider the specific requirements of European public health care models.
- The wide and ambiguous concept of "unmet clinical need" should be very strictly defined or even substituted, in order of not to reduce the requirement or full phase III clinical investigation of incremental benefit for a wide sort of new drugs used for conditions with therapeutic alternatives, always in need of improvement.
- If there is enough evidence, additional indications of a drug could be approved without being asked by the pharmaceutical companies.
- Objective should focus on products that address high unmet medical need; broader and earlier access coverage should not be a goal in itself.
- Increased transparency on the marketing status throughout Europe, is very welcomed. For any shift of data generation into post licensing, a definition is required which circumstances and criteria have to be fulfilled. Also, a description should be provided how, for what purposes and based on which methodological requirements this evidence will and can be used for follow-up assessment of benefit-risk assessment.

- Obligations for the MAH for post-licensing evidence generation incl. funding needs to be described to avoid a shift of development-cost from the MAHs to health care systems.
- Medicines agencies can and should address the topic of affordability more. Concrete actions on affordability could be, for instance, supporting with the repurposing of medicinal products.
- With regards to compassionate use, it would be useful to issue regulation that ensures that the product should be given free of charge to patients who complete clinical trials, some companies offer their product for free until price and reimbursement decisions are made, others do not follow the same procedure.

Cluster 5 (industry):

- International registration system must be accessible and as flexible as possible to facilitate smaller players such as SMEs and start-ups to act as MAHs. This will require stimulation, education and early ongoing dialogue between regulators and developers at all stages of the process.
- A first step towards customized healthcare, or personalized medicines, is therefore to develop and implement solutions for the development of, and sustainable access to orphan drugs.
- It should be an objective that individual countries' sharpened focus on ensuring national supplies of critical products should not give rise to increased use of national measures such as export bans and quotas, which contribute to an artificial division of the market in the EU.
- Recommend an analysis of anti-competitive behaviour within the EU, including the use of dominant market position in the form of the use of supply quotas, national / territorial supply constraints, and other anti-competitive measures such as direct-to-pharmacy, etc. and their effect on supply problems.
- Availability and accessibility are depending of both profitability and affordability. A whole new economic system must be implemented.
- Oncology reference missing.
- Making all medicines authorized in one-member state accessible to patients across EU.
- The objectives are well defined and should be adhered too. Further areas to consider are (1) to adapt monolithic development rules for new products or new therapeutic tool (2) the importance of personalized diagnostic to foster personalized treatment and (3) enhance the "theragnostic" model to save time, resources for development of new drug and make efficient use of public money poured in private or public healthcare systems"
- Implementation of EU-wide harmonised categories of root causes in national medicines shortages databases as well as the inclusion of the API in said-databases as crucial for further comparisons and analysis on European level.
- Encourage an impact analysis of the regulatory burden for full-service healthcare distributors which are impacted when MAHs withdraw economically not viable products from the market as full-service healthcare distributors cannot choose to stop storing and distributing economically unsustainable products.
- The consultation document alludes to a number of various data sources such as consumption data, e-prescription data, distribution data that could help prevent structural shortages and crisis time shortages.

- 2 additional access challenges need to be considered: Issues of PDMP treatments with regards to only partial or no reimbursement, economic challenges and high which leads to formal patient access challenges; B. Procurement practices such as tendering where the decision is based on price alone affects patient access for PDMP cases.
- The strategy should consider European plasma collection policies and an urgent need to increase the plasma collection in Europe:
    - Establishing dedicated plasma collection programs, coordinate outreach campaigns for plasma donations
    - Allowing the coexistence of public and private plasma collection centres
    - Encouraging plasma donations by allowing compensation of donors
    - Differentiation between whole blood for transfusion and plasma for manufacturing
    - Alignment of EU and US donor eligibility requirements
    - Donation frequency and volumes - More frequent donations and nomograms should be considered based on published literature and U.S experience
    - Medical doctor presence requirement in plasma collection centres and guidance for those EU countries.
- The telematics strategy (IDMP/SPOR) should be pushed forward, as availability of the information can significantly increase speed of processes.
- Ensure availability of critical medicines in the EU/EEA by supporting increase of production capacity to meet demand, and by establishing incentives to secure existing API production in Europe.
- Consolidated a list of critical medicines accepted by all MSs does not exist. Creating such a list should be added as one of the objectives of the EMRN.
- Include the contribution of the EMRN to the EU vaccination information portal. Increasing the visibility of the portal to the public should also be included in the EMRN objectives.
- Availability of medicines and in this context avoidance of drug shortages is complex and policy solutions require a holistic and global approach.
- Holistic functioning across the medicine development continuum with an institutional memory of previous interactions and agreements is essential, ideally facilitated by a single platform for effective sharing of information.
- Tailored approaches for value added generics (with new formulations, dosages, innovative presentations) are needed to incentivise this type of innovation, such as the development of accelerated assessment pathways.
- The particular focus on solutions for the generics/off patent segment would be applicable to veterinary medicines too.
- For Goal 2, there is a need for innovative and flexible approaches to enhance the scientific advice process to address concerns such as the disconnect between EMA led scientific advice and national CTA approvals and to help ensure that strong scientific input from EU regulators is provide.
- The current regulatory environment needs to adapt and keep pace with the innovation of radiopharmaceuticals to ensure Europe-wide access of centrally authorised medicines.

- Mapping out the root causes for unavailability of human medicines needs to be considered particularly at member state level as this is most often due to complicated processes, policies and laws to inform pricing and reimbursement decisions.
- Further attention should be given to the development of procedures to update, where justified by an identified risk, older veterinary dossiers, via a simplified procedure based upon PKPD analysis, as a way to ensure adaptation of SmPCs to current scientific knowledge without endangering the availability of veterinary medicines.
- The EMRN Strategy might be overly optimistic regarding the impact of Regulation 2019/6 on innovation, which provides very little incentives for innovation (except for minor species) and availability. Regulation 2019/6 brings an equal risk to decrease rather than increase overall availability of VMPs.
- Strategy fails to recognise the importance of increasing collaborations with ex-EU mutual recognition partners to help avoid shortages, i.e. UK. Given that the market is often global, it would seem appropriate to consider opportunities for increased collaboration at a global level.
- With regards to the proposed matching supply data and forecast demand data of medicinal products at network level, the processes required for this initiative will need to be carefully considered before being rolled-out, and that further stakeholder feedback (e.g. from manufacturers) could help strengthen these processes.
- Goal 2 should also include follow-on for off patent medicines. The specificity of development, methodology of collecting evidence and impact on market access need to be tackled from a different perspective than for originators' products.

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Increase in distributed/decentralised manufacture which will result in an increase in micro-supply chains.
- EMA should liaise with the Commission in order to address and protect the rights for accessibility of medicine of all EU patients, and if this requires the establishment of a harmonized procedure for HTA.
- EMAN to remain cautious regarding rolling out post-licensing evidence as there is a need to ensure that licensed medical technologies are safe and give true added value.
- Like to see clear, strong and enforceable policies for ensuring collection of post-licensing evidence, and a simple, quick process for rescinding marketing authorization and withdrawing products from the market across the EU if this evidence proves concerning.
- The strategy should address in more detail how the new horizon scanning mentioned differs to the existing Euripid-, EUnetHTA- and BeNeLuxAI-related horizon scanning schemes, how the new scheme will interact with these existing schemes, and how the EMA will ensure Member States comply.

- Suggest exploring how conditionalities (for example at the marketing authorization stage), selective licensing practices (licensing only to companies with good reputation regarding shortages) and sanctions (loss of marketing authorisation if found to be causing shortages) can dissuade industry from actions that lead to commercially driven shortages
- Explain how increased transparency will be achieved and how responsibility will be divided
- Strategy should also cover the challenges that data collection, measuring and reporting already pose to some for all or some Member States. Additional metrics may just serve to further overburden Member States with fewer resources.
- Availability of orphan drugs in all European country should be addressed as a challenge.
- Joint strategies on HTA and pricing is another challenge not included.
- It should be highlighted that adaptive pathways and conditional approvals does not come at the cost of patient/citizen safety (same with use of medicines and vaccine in crisis such as COVID-19 pandemic).
- Preventing misuse of orphan medicine status and regulatory incentives (e.g., use for personalised treatments for more prevalent diseases).
- Less prevalent use of PIP waiver for paediatric medicines - introducing the 'mechanism of action principle.
- It is important to differentiate shortages of cheap/essential medicines caused by supply chain disruptions and unavailability of innovative medicines due to commercial aspects, including a high price.
- Promote use of high-quality real-world data (RWD) in decision making (this applies for both, human and veterinary) and should be included in the strategy.
- Revise EMA guidelines on CUP as EMA is restricted its role on the organisation of CUP (article 83.4.).
- There is no EU register of CUP even though Member States have an obligation to notify CUP they authorise to the EMA. This challenge should be included.
- Patient organisations and/or learned societies (HCP) or medical coordinators of European Reference Networks could request an EMA opinion on a CUP.
- The issues of MAH notifying authorities of their intention to withdraw less than two months before the interruption in the placing on the market of the product does not leave enough room to find an alternative.
- FDA has a "right to try" act for life threatening diseases. The possibility to have a similar legal framework for EMA to access investigational drugs should be investigated.
- The Strategy should include a more explicit commitment to strengthening patient involvement in early dialogues, evidence planning , and in HTA assessments that take place at national level
- It will be important to understand the access barriers patients experience in different EU countries and in different disease-areas and it may be necessary to conduct a research mapping exercise on patients' access to new medicines, the access barriers different groups of patients experience in different countries, and the causes.

- Active engagement of patient organisations will be needed to improve the way medicines agencies provide information in a way that meets their needs and respects health literacy principles.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Human and Vet NCA should work better together to enhance cooperation when shortage occur and make it easier for health professionals, including veterinarians, to source medicines from other EU countries.
- One of the main EMA activities should be the central information collection and monitoring of (anticipated) medicine shortages at EU level in close collaboration with HMA, complementing existing national systems, through further development of the EU SPOC and i-SPOC system, taking into account signals of shortages generated throughout the supply chain including in community pharmacies.
- Challenges on parallel trade and product shortages should be included.
- Take into consideration illegal channels for the distribution of counterfeit and illegal drugs.
- In a crisis situation, a multisectoral analysis and response team must be activated.
- Coherence in national legislation and regulation on trade of medicines should be strived for with European solidarity on negotiations with manufacturers are necessary.
- Regarding availability of human medicines, EMA should continue to improve the time requested for the scientific evaluation.
- In addition, it may be a good idea to move towards a free scientific advice, which will certainly improve the quality of NDA applications.
- Support an expanded role of the EMA by increasing resources and by clarifying/ updating its legal activities by amending Regulation (EC) No 726/2004.
- EMA can also have a role in further harmonizing at EU level the different existing definitions of medicine shortages to allow for central monitoring.
- Strategy needs to have a particular focus on managing the impact of Brexit on medicines supply across Europe, especially countries that are dependent on the UK market such as Ireland, Malta and Cyprus.
- A better understanding of the reasons behind the concentration of MAHs for some products in some countries would be needed
- Network Strategy mentions the aspect of off-label medicines; however, we would like to see a greater emphasis on this topic
- Recommend analysing the existing situation concerning off-label use of medicines and creating a framework that would be conducive to defining which currently used off-label medicines, supported by robust evidence, for other indications should be made available

Cluster 3 (research):

- Over-reliance on user fees setting up a regulatory capture risk
- Ethical, legal, regulatory and societal (ELSI) issues relevant for children as 'future generation' should be appropriately considered

- Correct paediatric indicated medicines in the exact formulation and doses will improve adherence and ultimately improve the daily lives of children and their families and this should be considered within the strategy
- Elements aiming to facilitate the undertaking of clinical trials should be included in the strategy since they provide early access to innovative treatments
- The strategy addresses issues of availability and accessibility of medicines in a post-marketing setting but pre-marketing is not addressed, i.e. through clinical trials or early access schemes, are not addressed
- Providing early access through accelerated regulatory procedures or PRIME scheme, aligning the agency resources to enable a greater use of such procedures for medicinal products addressing high unmet needs, and early involvement of other stakeholders, HTA agencies
- The feasibility of applying some of the regulatory flexibilities introduced in the context of the COVID-19 pandemic, such as accelerated scientific advice, rapid agreement on paediatric plans and additional support measures, could also be evaluated for all situations with high unmet need
- More opportunities for early dialogues that involve regulators, HTA bodies and patients, should be implemented
- With non-standard clinical development (smaller number of patients, lack of placebo control due to administration modalities, etc) and the critical importance of RWE for their longer-term evaluation, new approaches are needed for the assessment of ATMPs, with greater alignment on data requirements for regulators, HTA bodies and payers throughout the product lifecycle and across Europe
- The possibility of having patients moving cross-border for their treatment and the challenges associated with that, as well as the qualification of centres for ATMP treatment are not addressed in the strategic document
- Even though European legislation that allows for cross-border healthcare does not fall in the scope of EMA/HMA, regulators' input to define requirements for Centres of Excellence may be important to justify patient's travel within Europe for their treatment
- Greater political involvement and decisive action in ensuring that the development of medicines and therapies, which have little or perverse market incentives are supported by a range of policy tools including more significant grants for development as well as innovative payment mechanisms like pooled procurement, procurement guarantees or subscription models for new antibiotic
- EU could consider is the US FDA model of "priority review vouchers" or "transferable supplemental protection certificates"
- The strategy could be supplemented by addressing the different standards for complementary and alternative medicine (CAM) approaches, and the effects that such diversity of standards for CAM has on quality, efficacy and safety of products, as well as on public trust on medicines
- A key challenge to be addressed is the hesitation of developers to use NAMs as they are unsure whether the scientific evidence generated will be accepted by regulators
- A solution, as mentioned in RSS, would be to develop clear guidance to encourage and prioritize the use of NAMs that can be used to fulfil testing requirements in lieu of traditional animal tests and that take the 3Rs into serious consideration.

- Another challenge is the current overreliance on animal data, which can result in the pursuit of unsafe and/or ineffective drugs or the abandonment of drugs that may have actually 'worked' in humans
- A solution to this challenge would be to encourage the conduct of retrospective analyses of existing animal tests required for drug development. This would help fully characterize their reliability, reproducibility, and applicability domain, which would in turn encourage a significant move towards the use of more human-relevant methods.

Cluster 4 (public body):

- More cooperation between COMP and CHMP about, e.g., significant benefit and the benefit risk assessment, may provide more clarity on the real added value of those products
- There are too many individual and uncoordinated national initiatives working on shortages within different Member States and this should be coordinated at EU level to address the challenge
- Clear definitions for "high unmet medical need" and "critical medicines" are lacking
- There is a need to focus on EU pricing models.
- The issue that increasing post-licensing evidence generation may lead to the approval of medicines with unfavourable benefit risk ratio and interfere with the generation of robust evidence from clinical trials. In these situations, the reliance on generation of post-licensing evidence should be limited and pre-planned, with quantitatively pre-planned regulatory outcomes. This should be included in the strategy.
- A potential solution can be a methodology that helps to predetermine not only the design of the studies and actions contained in the authorization conditions, but also the outcome of the conditional authorization process based on the observed results. The expected magnitude of the effect required to continue the commercialization of the product can be set a priori, as well as a clear-cut time frame to obtain it, and several scenarios with their corresponding regulatory outcome (full authorization, restricted labelling, withdrawal…) and HTA outcome for access (low to high price as value is demonstrated with clear-cut boundaries and timeframes).
- EMA collaboration with HTA bodies and payers should aim to produce closed agreements to interpret post-licensing evidence, benefit risk ratios that will be acceptable to maintain products on the market and how these will relate to proportional reimbursement

Cluster 5 (industry):

- HMA/EMA network could consider the challenges posed by the fact that regulatory approval for innovative technologies are increasingly being based on single arm studies, which may lack the necessary comparative evidence for regulatory decision making, resulting in complexities in overall evidence generation.
- Mutual recognition between competent authorities have to be promoted
- New incentives, institutional reforms are necessary
- Cross border care has to be systematically assessed, protected and proposed when health facilities are inadequate in Member States; national cooperation through European Reference Networks (ERNs) have to be developed

- Ensure clinical development satisfies both regulators and HTA bodies from the beginning of development, with a possible harmonisation across Europe. Improving efficiency in order to reduce time of development and get patients access new medicines earlier.
- Full EVMPD database (with the exception of development Products) should be made public
- Suggestion to modify the current wording of Article 126a of the Directive, in a manner which shall enhance the instances of its application, and, triggering i.e. by rendering it applicable also in cases of scarcity and/or non-availability of medicinal products, as also, in instances of high cost (unattractive prices) of the already available (similar) products in the concerned
- Consider a proper reward for any industrial candidate able to manage a tech transfer to develop new drug when market authorization is not guaranteed.
- A challenge inadvertently leading to shortages is the application of supply quotas by MAHs to full-service healthcare distributors /full-line wholesalers. Full implementation, effective monitoring and enforcement of Article 81, paragraph 2 of the Directive 2001/83/EC would address this issue.
- EC together with Member States must work to ensure the accurate interpretation of Article 81, paragraph 2 of the Directive 2001/83/EC in national legislation
- Strongly encourage an investigation of current quota practices by the pharmaceutical industry and their impact on the supply chain.
- Investigating how custom clearance timelines could be reduced and implemented.
- Collaboration with HTA bodies and payers should be extended to include National Immunization Technical Advisory Groups (NITAGs). An early and accurate estimation of vaccine demand would require a collaboration between regulators and NITAGs.
- The topic of enhanced communication on cooperation against vaccine-preventable diseases to patients, HCPs and decision makers should be include in the strategy.
- Implementation of plasma collection policies and increasing the plasma collection in Europe, which will address the increasing need for source plasma in the EU (based on rising clinical demand better and earlier diagnosis and an ageing (patient) population, extended range of indications and others)
- An increased European contribution to the global resource 'plasma' is needed.
- Security of supply must be ensured by addressing the root causes of medicines shortages and implementing sustainable economic, regulatory and industrial policies, rewarding security of supply.
- To address transparency of the supply chain, it needs to highlight that the authorities have a full overview of the supply chain of each medicinal product and a quick search tool is needed to identify which products might be affected by issues in the supply chain.
- Promotion of efficient public procurement, according to the core principles of transparency and open competition, and the implementation of incentives for prescribing biosimilars and will create a sustainable market attractive for biosimilar medicines manufacturers to compete and increase patient access while avoiding medicines shortages.
- Recognise the need for improved understanding and transparency of Member States' demand and will allow for an increase in production capacity for critical medicines in order to meet country patient needs rather than demand.

- There is also an underlying allocation challenge which was highlight during the COVID-19 pandemic when it comes to supply and demand. Practices such as parallel export and stockpiling are disruptive.
- The overall value of pan-EU scientific advice is undermined when contradictory opinions emerge during the development of a product. There is no unified vision on the progress of a product during its development from early clinical trials through to approval.
- Providing enhanced advice options with greater flexibility in the delivery of this advice is needed to reflect the changing pace and process of innovation along the development continuum. This envisaged dynamic advice is also needed to adequately accommodate specialised input for specific types of products.
- The broadening and integration of regulatory advice should better bridge the advice and decision-making gap across the EU regulatory system (i.e., EMA, EMA's Committees, NCAs) and beyond (e.g., EUnetHTA, US FDA).
- Patient relevant shortages, as opposed to manufacturing/supply shortages, will only be visible if patient level supply data becomes available. EU-wide harmonised definitions for shortages at both the manufacturer and patient levels are needed, and a common reporting system should be used.
- The challenge linked to the worldwide complexity of CMC life cycle management is missing
- Availability and accessibility of veterinary medicines are not specifically addressed by the strategy due to the ongoing work on Regulation 2019/6. A long-term objective to monitor the impact of the provisions of the new legislation, so as to continuously check if the objective to increase the availability of veterinary medicines has been met, in particular for products intended for minor uses/minor species and in smaller markets.
- The strategy could also reflect on the fact that National requirements related to SPC, PIL and package are a significant source of extra costs, which especially hit legacy products in smaller markets.
- The implementation of the guidance on detecting and reporting medicine shortages is required as many countries are implementing their own legislation in parallel.
- Requirements for more storage or stockpiling of medicines are not deemed a sustainable solution.
- A specific focus by the EMRN on paediatric and orphan medicinal products would be welcome.
- The outsourcing trends of pharmaceutical companies was named as another challenge to the manufacturing chain and thus affecting the quality and availability of medicines.
- The current legislative framework allows for the use of unlicensed products which in turn hinders availability and accessibility of radiopharmaceuticals in many parts of Europe. Reliance on a system of one-off use products allows access to therapeutic innovations exclusively to those who can attend highly specialised centres in certain countries.
- Greater emphasis should be put on centrally authorised products to be accessible across Europe.
- Actions aimed at decreasing dependence from supply from outside Europe may increase the risk of drug shortages: a proven robust manufacturing and supply chain is an alternative option to be pursued.

- Quality of APIs received from outside EU can be assured by putting in place an inspected supplier management system with effective audit rather than introducing restrictive measures at the third country level.
- EU competent authorities could perform additional inspections of API manufacturers if the company's supplier management system and internal audit program are not regarded to be robust.
- Inspection programme can leverage the excellent experience gained by the EDQM performing inspections of API manufacturers.
- Increased convergence in international requirements is desirable: reliance by recognition of inspections should be possible if the inspectorate performing the inspection is a PIC/S participating authority. This should allow waiving of import testing rather than having a formal MRA.
- Defining "critical medicines" is challenging with national interpretations and the need of all patients should be considered important. A flexible regulatory system that is able to respond to a health crisis will protect the health of all patients.
- Findings from EMA PLEG Focus Group should be embedded in scientific advice/EUnet-HTAs parallel consultation and shared transparently in the multi-stakeholder forum. Propose a harmonized approach of HTA and scientific assessments at the national level.
- Facilitating switches from prescription to non-prescription (Rx to OTC)
- Reinforcing application of the principles of mutual recognition as a way to relieve administrative burden across NCAs, especially in smaller countries that have less resources.
- Better acceptability of article 10a for well-established products should be encouraged as a legal basis.
- Integrating measures that will tackle and improve Health Literacy to supplement accessibility of medicines.
- Dedicated objectives to improve accessibility of non-prescription medicines. Encouraging widening access, and encouraging innovative solutions, should be part of any strategy for improving access to medicines.
- Putting in place solutions to keep older essential but less profitable products on the markets (e.g. lower fees/maintenance costs)
- Revision and prevention of the application of short-term cost containment measures to generic medicines as they are undermining the long-term sustainability of manufacturers while increasing the risk of medicines shortages which ultimately affect patient health
- Prevent disproportionate sanctions that can increase the risk of medicine shortages
- Incentivising the MAHs to mitigate shortages by registering alternative manufacturing sites/ API

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- European Public Health Alliance's Working Group on Medicines Shortages.
- CIFA consortium project, working to secure support for the WHO C-TAP
- -European Alliance for Responsible R&D and Affordable Medicines, a pan-European coalition of institutions and individuals active on pharmaceutical policy issues, including medicine shortages and other EMA related topics
- ECL Access to Medicines Task Force, consisting of 20 staff members of national cancer societies working in the field of medicines, research and advocacy
- EMA/HMA and national/local cancer societies can provide connections with patients and further expertise related to cancer care in the MSs
- Review of existing biosimillars for rare diseases, discussions with industry and healthcare systems regarding difficulties in making them available
- Compassionate use: advocacy for more harmonisation among Member States, planning a prospective research on the difficulties for developers to organise a compassionate use, identifying internal issues or issues in relation to the complexity and diversity of national regulations
- More collaboration with EMA and national agencies to discuss political issues with patients is both desirable and necessary to effect change
- BEUC's position paper on medicines shortages identifies some additional measures that should be undertaken at the EU and national levels to address this challenge
- EPF willing to collaborate with different stakeholders, including EU and national regulatory bodies, HTA agencies, pricing and reimbursement bodies, and academic researchers to develop a comprehensive evidence-base on patients' access to medicines as well as engage in dialogue regarding solution
- International Pharmaceutical Quality (IPQ) Publications
- TIF.ACCESS programme, that includes the organisation of multi-stakeholder meetings at national and European levels, the publication of information leaflets and the release of position papers focusing on accessibility.
- DITA taskforce of Eurordis
- Lymphoma Coalition we build a global database on access to medicines, which are approved or reimbursed, or accessible thru special access scheme and organise this information by lymphoma subtype and by country.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Create digital programs to help citizen to self-manage their health conditions
- Digital transformation in drug safety
- The EAU leads the academic consortium on an IMI funded BD4BO project on prostate cancer and we are happy to share experience

- Promotion of the registration of clinical data by GPs to increase the development of Big Data useful to the individual GP, but also to the Regulatory System for pre-approval and post-approval decisions.
- FVE is involved in several projects and has organised several workshops on digitalisation in veterinary medicines. We are also looking at this aspect in veterinary education.
- PGEU has summarized the commitments of European community pharmacist as well as several policy recommendations on Big Data & AI in its Position Paper on Big Data & AI in Healthcare. In addition, PGEU has outlined its vision for community pharmacy 2030 in a paper which also addresses the vision and best practices related to the integration of real-world evidence and digital technologies in community pharmacy practice
- Many ECPHM members are working on the (harmonized) digital assessment of animal health, biosecurity, economics of animal disease in Europe, etc.

Cluster 3 (Research)

- ESMO is currently working on several projects in the area of big data and artificial intelligence and will share its findings with the EMA/HMA in due course. Additionally, ESMO and the EMA are collaborating with each other to tackle some of the topics mentioned in this focus area.
- Clinical Practice Guidelines are crucial for oncologists to deliver the highest standard of care to their patients.
- EPTRI is developing a paediatric Data Interoperability (including FAIRification) common service to facilitate and support use and re-use of data for research purposes, paediatric biological data, to be implemented in collaboration with ELIXIR.
- ISPE has developed the Pharma 4.0 that will help pharmaceutical companies move towards a more fully automated environment that considers data integrity from the beginning of the design period based on a "Holistic" Control Strategy approach
- The Avicenna Alliance is working alongside EMA and FDA towards harmonization for the use of digital evidence.
- TEDDY has a specific expertise in ELSI issues including data protection issues addressing also paediatric peculiarities. It is particularly engaged in developing activities/research in this field within EPTRI EU project.
- SIOP Europe is working on the development of a multi-national framework pooling the European paediatric oncology healthcare and research data and making it findable, accessible, inter-operable and reusable (FAIR) for science and innovation
- ARM looks forward to being part of an inclusive and solution-driven dialogue with the European Commission and other relevant stakeholders in shaping the path forward.

Cluster 4 (public body):

- EMA/EFSA systematic literature review AI pilot (already successful on a single bacterium pilot)
- Analytics through a shared ENVI data-lake and computational platforms, together with DIGIT and SANTE.
- A national project, called Management of indication-based patient registries for the monitoring of expensive pharmaceuticals, which has the aim to standardize patient registries

- ZIN is participating in the IMI Get Real II project, which has the aim to investigate the use of real-world data
- Ongoing discussions in relation to the above comment and the way forward with the EMA, CMDh and the Member States
- The Catalan Health Service has implemented a patient and treatment registry (RPT) for high complexity medicines.

Cluster 5 (industry):

- ACRO has recently established a specialized committee focused on technological innovation and the increasing digitization of clinical trials.

Strategic focus area: Data analytics, digital tools and digital transformation

Question 6: Do the objectives adequately address the challenges ahead?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- The role of the EMA in securing the quality of the health data (incl. access to raw data, data validity) should be enhanced. Particularly ahead of the upcoming European Health Data Space file
- Strategy could be more ambitious
- Expand ethics on use of big data
- It is not clear what is meant by dynamic regulation
- Patient engagement is missing
- It is important to improve clinical trials design, so they provide evidence that is robust and takes into account new technologies
- EMA should appoint external consultants to bring necessary competences
- Establish a clear framework to ensure that big data is used and AI is applied considering the principles of fairness, transparency, purpose limitation, data minimisation, accountability and privacy and security by design and by default.
- Patients should be treated as stakeholders
- Promotion of the use of high-quality real-world data should include patient-generated data; mechanisms for patient input must be expanded and strengthened, both at EU level and nationally.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- The digital transformation of healthcare, pharmaceuticals and medications plan will also have an effect on the future developments of Electronic Health Records
- Interoperability between different healthcare data bases requested
- Use of digital tools and digital transformation in veterinary medicine is lacking in the paper
- Patient data must be processed under a high level of data protection standards within trustworthy infrastructures that enable the access to secure data services.
- At the moment, digital tools are lacking but they might be very useful not only for users and consumers, but also for farmers that would monitor their farming efficiency.
- Apart from AM use and AMR we also have to assess animal health in parallel to all these data. Otherwise we might 'miss' decreasing animal health because of reduced AM use
- Important to establish an information flow system among all stakeholders, managed through a drug safety system
- Use of patient data requires the existence of an appropriate data governance model based on the WMA Declaration of Helsinki
- The production of Big Data in healthcare could be further facilitated, via linking electronic health records with e-Prescribing systems, allowing health professionals involved in patient care to access the necessary patient's information, subject to the patient's consent

Cluster 3 (research):

- Ensuring some standardization or interoperability directly with the software providers might be the best or easiest way to go
- Alongside the establishment of a new platform aiming to foster cooperation and build confidence among stakeholders, the EMA/HMA network also needs to establish a framework for data availability
- Proposes to see an additional strategic goal to fast-track the use of RWE for ATMPs by convening a multi-stakeholder forum on the issue in order to establish a European framework for regular RWE use
- The suggested set of objectives aiming to enable the access to healthcare data are not detailed enough
- A common agreement between regulators (pan-European and national), HTA and other stakeholders on data requirements is an essential pre-requisite to ensure the capture of relevant data throughout the product lifecycle. The number of opportunities to have common scientific advice procedures involving regulators and HTA agencies, at pan-European (EMA), national or international (e.g. EU-US) levels, as well as the internal agencies resources to cope with an increased number of applications should therefore increase to ensure alignment on the data to capture pre- and post-approval.
- Healthcare data should NOT become a commercial commodity
- The shortcoming of clinical trials seen within human medicines can also be found with the veterinary area

Cluster 4 (public body):

- Clear rules on data ownership including data transfer to third parties and for withdrawing consent need to be established
- Data quality definition and very practical guidelines are paramount before standardization
- Do not consider that a "shift" of the emphasis in the activities before approval has to be made to enhance the post-approval activities as stated on page 10 of the strategy, but that they have to be complementary
- Before a sustainable platform to access and analyse healthcare data from across the EU can be delivered, the objectives for the management of sources of real world data should be focused on: 1) Identifying existing sources that might be useful for real world data generation and 2) implement collaborations with different institutions and initiatives to develop standards for digital data
- In addition to the establishment of an EU framework for data quality and representativeness it is of utmost importance to generate guidance on the value and use of the evidence generated from this data.
- The overall concerns on deriving causality from observational data should be carefully considered

Cluster 5 (industry):

- Disagree that the goal 4) "Ensure that data security and ethical considerations are embedded in the governance of data within the Network" should be an important strategic objective. Following the data protection regulations should be considered as a default obligation but not a goal within an effective strategy.
- The sheer increased volume and complexity of data ('Big Data') should not be considered as an obstacle if the goal is to implement efficient processes and digital tools. The strategy should instead propose concrete steps and technologies that can handle large volumes of data of all complexities.
- A lack of regulatory standards, guidance and validation should not be defined as an obstacle. To the contrary, it should be the objective of EMA and regulators to devise and update regulatory standards in such a way to enable progress via digital transformation.
- As part of the strategy, EMA shall define progress in digital technologies as a priority and regulatory processes shall be adapted to these
- Data should be fit for purpose
- Real-world data (RWD) data sets should be fully transparent and traceable - to enable confident decision-making
- Data should start out minimally processed and transformed; all subsequent transformations should be documented as part of a regulatory submission
- Adherence to government standards on use and storage of RWD should be verifiable through an audit log
- Regulators do not understand/regulate medical gases

- An over-arching mechanism/board/team/person is missing overseeing, monitoring and steering the digital transformation in collaboration with the TMB making sure standardization of data, multiple use of standardized data sets across systems and fit-for purpose resource allocation and financial support
- It will take many resources to gain necessary competence within the network
- Patient consent is important when using big data
- An inclusive strategy for the utilisation of real-world data should not be limited to the treatment of unmet medical needs but should also help improve understanding of treatment outcomes for established medicines including traditional and complementary medicines
- Industry is moving forward, very quickly in this area and it is important that other stakeholders in the sector (e.g. regulators) have the appropriate expertise to engage in constructive dialogues and finding pragmatic ways forward
- Appropriate governance and oversight of digital healthcare to encourage and enable secure sharing and use of high-quality health data within a European Health Data Space (EHDS)
- Greater use and reliance on real world data (RWD) uncovering insights from better data analytics and sharing information across the healthcare network
- Adequate, clear and cohesive provisions to develop the use of AI
- Greater education of all stakeholders (patients, physicians, healthcare decision makers, etc.) and communications on the potential added value of digital transformation to society
- There is a need for data standardisation in terms of collection, quality and management
- Well defined standards for data quality can yield more consistent data sets and drive interoperability, leading to insights that address unmet medical needs, and the development of innovative care pathways and treatment paradigms
- Accountability is at the core of data ethics and governance, providing clarity and distributing accountability fairly to ensure overall trust in AI and Big Data solutions. With appropriate governance, validation and internationally and globally recognised standards, we can ensure interoperability of the digital infrastructure, reliability of the technology and mitigate the risks of error, concerns about privacy, bias or inequality.
- There is a need to go beyond creating a technical structure and framework (e.g. DARWIN) and building IT capabilities and have an aligned approach and understanding within the Regulatory network on how to assess and use for example RWD for decision-making
- The current strategy on its systems is fragmented and under-resourced. Significant investments and attention will be needed to make the EU regulator`s system ready for the future.
- Real world evidence is already generated now from various sources and is planned to be used to support regulatory decisions (also for efficacy) globally. Acceptance within EU network and clarity on expectations is crucial, e.g. a dedicated RWE expert group within the EU network would be helpful.
- There is a need to promote use of (quality) RWD and this could be achieved by sharing use cases and lessons learned among stakeholders, development of dedicated guidelines would be considered very beneficial. This development of RWE guidelines should also involve the EU HTA

network. Until an EU wide accessible data platform is created, it is important to harmonize RWD quality standards and criteria across EU.

- It is essential to establish novel ways of evidence generation. Aside the opportunity to further inform on safety profile of compounds with digital tools and use of RWD, it is considered an important area to support innovative drug development.
- In the area of development of anticancer medicines, like precision medicines or advanced therapies (cell therapies) this will play an increasing role. This especially refers to rare disease for which RCT are not possible.
- Digital tools and leveraging real-world data can be a cornerstone for such novel ways to generate acceptable evidence, and with that provide timely access to innovative treatments. However, to meet this aim the current regulatory pathway might need to adapt, as well as HTA approaches on comparative effectiveness, which could be supported by external clinical data.
- The objective "Build EU Network capability to analyse Big Data" may not fully address the immediate needs of the EMRN. The scope could be widened to also include an initial focus on RWD and other more structured evidence sources to reflect the current needs and use of this data for regulatory decision making within the EMRN.
- The objective "Collaborate with international initiatives on Big Data" is welcome. However, it may be useful to specify specific initiatives where EMRN seeks to collaborate with leading global regulators to deliver the EMRN goals.
- A "somewhat static regulatory process" is raised as a challenge but not fully addressed by the Goals/ Objectives
- Objectives relating to data discoverability, data security and governance are important for the network to deliver. However, we feel these specific actions should be considered business as usual rather than having specific attention drawn to them through the EMRN Strategy.
- It is crucial that the Network consider the need for interoperability of data; medicine agencies, industry, HTA bodies, payers etc. should be able to operate within a standardised network to ensure efficiency
- More transparency is needed in terms of the expertise available to, and opportunities to collaborate on, data processing capabilities and sharing of relevant expertise on AI/big data challenges within the EU network
- We strongly call for more hand in hand and streamlined work between EMA and HMA in the on-going telematics and ePI projects. Some parts of the SPOR/IDMP project get continuously delayed due to the lack of clear governance and ownership. Patients would clearly benefit (directly or indirectly) from the implementation of these systems.
- In addition to ensuring data interoperability across data sources, regulators should consider the need for more formal data-sharing agreements among stakeholders
- Establishing an EU framework for data quality and representativeness is important but it should also address data standardization & codification. This last measure needs to be addressed through legislative measures in order to ensure pan-European adoption.
- Any digital transformation strategy will have to take into account the reality of all veterinary manufacturers, including generic and small-scale companies
- Developing systems for monitoring of environmental impact and AMR (p. 12, 13) should not be exclusively for veterinary medicines

- It is important to map the use of data and needs in veterinary medicine, but this should not be limited to pharmacovigilance, AMR and environmental matters as stipulated on p. 12 of the document
- Call for more hand in hand and streamlined work between EMA and HMA in the on-going telematics and ePI projects. Some parts of the SPOR/IDMP project in particular get continuously delayed due to the lack of clear governance and ownership.
- We believe that real-world data should not be seen as only "complementary to clinical trials data", there are cases where real world data could be leveraged directly to support a switch from prescription to non-prescription (Rx-to-OTC switch) for instance
- If complementing pre-authorisation studies with additional RWE studies, data protection should apply for any new indications or additional populations subsequently approved
- RWE studies, where used, should be defined, agreed with concerned authorities and have a finite duration
- The ambition to access more and more health data is noted
- Collection and analysis of data should be limited to facilitate making regulatory decisions on medicine and medical device applications and post-marketing activities. Care should be taken to avoid data activities distracting the network from its core function as the European Medicines Authority.
- As more and more data become available to the Network, it should be possible for industry to have access to data sets that could aid in the development of new medicinal products to address unmet self-care medical needs
- Agree that RWD and genetic data can play an important role in drug development, and that safety and efficacy analyses of these data can potentially decrease the need for large scale outcome studies
- EMA/HMA are encouraged to recognise the challenges of using RWD in their strategy and outline plans for the development of flexible approaches in the evaluation of applications which use this type of data
- Encourage the Agencies to consider developing additional guidance on the use of RWD in drug development.
- The application of the GDPR in clinical research should be highlighted in section "3.2 Data analytics, digital tools and digital transformation"
- Depending on interpretation, GDPR can considerably limit how data are used and/or analysed in clinical research. This should be recognised in the challenges and interdependencies section of this chapter
- EMA/HMA should be open to the utility of the non-routine data gathered through novel modalities as they can be important in regulatory decision-making. Furthermore, EMA/HMA are encouraged to clarify if they also consider this to be RWD. This would help ensure drug developers are better aware of EMA/HMA's expectations inform on the appropriate uses of these datasets.
- The draft strategy does not seem to consider the scenario of digital endpoint data that can be collected as part of a clinical trial. EMA/HMA are encouraged to revisit this section and provide more clarity around their thoughts on the utility of digital endpoint data in this context. Further detail on the EMA/HMA's views on the role of digital endpoint data to support future regulatory

applications would ensure Sponsors can align the design of their clinical programmes with the Agencies' expectations.

- Digital transformation shall be also understood as a substantial investment in a Telematics infrastructure (I.e. fast implementation of SPOR and TOM at EMA and NCAs), digitalisation of regulatory processes across the whole network and interoperability of various telematics projects. Digitalisation of the regulatory operations in the EMRN shall be considered as a Priority Number One in the Network Strategy.
- Data analytics and new digital tools need to be aligned with the overall EU Digital agenda and Regulatory optimisation
- Multi-source, off-patent medicinal product environment requires different approaches with different data sources to innovative medicines and this needs to be reflected in the digital strategy
- Digitalisation of regulatory processes across whole network and interoperability of various telematics projects shall be considered as a Priority Number One in the Network Strategy.
- The decision-making process should avoid multiple standards and build on existing data and knowledge, meanwhile the regulatory environment needs to be prepared to validate and ensure reliability, quality and regulatory compliance of the data. This includes specific attention to legal and ethical aspects and protection of patients' interest.
- We welcome a data-sharing culture that could inspire all the regulatory network and stakeholders involved, with the condition that patients' privacy is protected.
- The strategy document should include specific steps and avoid vague terms such "digital techniques" and instead provide a clear roadmap how digital transformation should be achieved
- Public and private stakeholders, pharmaceuticals, providers and patient groups, governments and NGOs should cooperate to build a shared standard and a platform in which health data management is facilitated: This platform should be strictly regulated to ensure the correct application of the following principles: 1. Ownership of data by citizens, with full control of collection, access and usage; 2. Secured data, using cutting edge technology (encryption, blockchain, etc.) and sharing using smart access control; 3. Interoperability of data between various sources and services to enforce quality and permit deep analysis with anonymization and deanonymization technologies; 4. Affordability of services: free or reimbursed, prescribed or not, except special apps for life style usage; 5. Transparency through an open source OS to allow multiple services within the same platform; 6. Usage of health data allowed only for global and personal health care and well-being; 7. Regulated research usage allowed without remuneration of data owners after informed consent; 8. User friendly social network to connect stakeholders and easily share scientific information.
- Incorporate tools from new medical device regulation in the evaluation and assessment of the medicinal products (data, manufacturing, testing...)
- Create a simple set of requirements for natural disease history analysis
- It is important that the sector jointly works on defining a framework for data standard, data quality, and data access (especially regarding GDPR and secondary use)
- Pursue RWE use cases / pilot programme to subsequently elaborate an EU RWE framework that sets out the principles for data use and standards, regulatory acceptance as well as best practices for application of analytical methods, in alignment with international efforts

- Assessment pathways to improve uptake of new digital tools should be developed and integrated
- Telematic Strategies should be integrated and harmonised across the Member States and the development of National Portals should be discouraged to avoid duplication of effort (e.g. national requirements for electronic SmPC fragments)

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Openness and availability of data and tools and analytics for all: research community, medicine experts, government and public
- The strategy should also address "big data" weaknesses and limitations, for instance the multiplicity of sources of data of great heterogeneity and fragmentation sometimes without any quality control
- We urge to focus the research into the clinical effectiveness and related cost and cost-efficiencies of use of big data in health products regulation
- Reproducibility, validated statistical analyses and transparency throughout the whole process (from data collection to data use) also need to be addressed carefully
- Whilst opening the network to an expansion in data technology, the strategy fails to mention how data technology facilitates data sharing
- It was concerning about the lack of required personnel and competencies to perform such a transformation, given our understanding that the move to Amsterdam also caused a loss of personnel and expertise for the EMA
- Ensuring research results and data sets from all clinical trials submitted to the EMA for marketing authorisation are publicly available
- The Network shall promote the development of high quality, harmonised, comprehensive and continuous patient registries in CVD across the EU members states

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Create a community response team to fake news and unauthorized treatments
- Assess animal health and burden of animal disease in Europe in order to better define necessities, etc.
- Impact of telemedicine in disease management, prevention and signalling is missing
- It is important to plan the communication processes related to security problems, to all stakeholders. The information that is received is as important as the information that is given.

Cluster 3 (research)

- Ethics Committee should solely review the in-silico trial protocol in view of the future clinical protocol and/or intended clinical use to ensure representativity of target population(s)
- Beyond legal requirements, an overall governance of personal data processing for health research should be developed aimed at addressing ethical and legal issues of secondary use of personal paediatric data in research projects and consortia
- Given that the principle sources of real-world data stem from electronic health records, registries among others, it is crucial for that data to be harmonised and the registries to be interoperable
- Harmonised implementation of the GDPR is crucial to facilitate scientific research within the EU
- The role of general practice / primary care registries in pharmacoepidemiological studies should be covered by the strategy
- A new and dynamic EU policy framework is necessary to support and drive the exploitation of Real-World Evidence and data produced by CM&S
- Developing a regulatory system for assessing and shaping the use of modelling and simulation data is required to bring healthcare into the digital era
- Need to recognise the added value of digital evidence generated by CM&S is necessary to enable the development of treatments for specific conditions, especially for paediatric, geriatric and rare diseases, whereby evidence cannot be generated by in vitro, ex vivo and in vivo models
- The availability of data and mechanism for data sharing to support investigation for problems that can be solved using CM&S including AI
- The following challenges should be covered by the strategy but are missing: 1) Addressing specifically the use of real-world-data in the context of paediatric cancers as a collection of rare diseases; 2) Medical devices are potentially highly pertinent for use in this population during treatment and clinical trial participation; 3) The development and use of safe and effective paediatric medical devices is thus an important area for exploration as data on this in paediatric oncology is currently lacking
- The pharmaceutical industry's current reliance on data from preclinical animal studies should be presented as a challenge

Cluster 4 (public body)

No comments were received from the public bodies.

Cluster 5 (industry)

- As part of the overall strategy, consideration should be given to its adaptation to/replacement of CTIS by a system that is sufficiently flexible to readily accommodate data submissions .
- GMP Annex 6 and EMA Guideline on Marketing Authorisations for Medicinal Gases really needs an update
- Dynamic Regulatory Assessment needs to be an integral part of the strategy.

- Explore the use of new sources of evidence, beyond RWD/RWE e.g. 'omics, digimarkers, other big data sources, patient perspective data
- Reliance on national or regional surveillance networks for the generation of real-world evidence (safety and effectiveness) is important to vaccines. The strategy should include a discussion on the continuous support by EU regulators towards a sustainable EU network able to deliver real word data on the benefit/risk of vaccines.
- The EUNS 2025 should explicitly consider Software as a Medical Device (SAMD), particularly as this is used in combination with treatments including medicines
- Greater attention should be paid to how Big Data powered by AI/ML will be used by regulators in their decision making, or by others in their own activities (e.g. beyond the Public Assessment Report)
- The EMA/HMA Network should enable each member state to curate and analyse data, using validated software, for the member state's specific regulatory needs, as well as to contribute to the EMA-wide network. This alignment of incentives should be considered when establishing an IT operating model that supports the EMA/HMA Network's strategic goal of building sustainable capabilities and capacity for RWD and advanced analytics
- The fact that digital tools are part of the new strategy is highly welcomed
- Enhance motivation of the NCAs to contribute to the digital transformation by manpower, money, willing-to change and can-do attitude
- A further crystallisation of the requirements for and hierarchy of the different data sources, i.e. how do natural disease history data play a role next to clinical trial data
- There is room for improvement in electronic communication and data interchange processes with supply chain partners, especially between the pharmaceutical industry and full-service healthcare distributors
- While the rise of data analytics is a strong component of digitalisation, we feel the objectives are overlooking other aspects of new technologies, such as 3D printing, connected devices and their application in healthcare, the implementation of e-prescription systems and their European compatibility, augmented reality, artificial intelligence, etc.
- The lack of a harmonized EU/Global approach and standards should be addressed
- With regards to technological progress in the manufacturing of medicines, Regulatory guidance is not consistently applied across the EU resulting in slow adoption of new approaches and technology. There is a need for greater harmonisation
- The ability to deliver a successful digital strategy depends upon the successful delivery of a foundational IDMP/SPOR programme (with TOM) across the network
- The breadth of goals described indicate a need for systematic collaboration across stakeholders beyond the EMRN and therefore leadership and collaboration may be required above and beyond the EMRN, i.e. globally
- Implementation of the objectives will require a regulatory framework and guidance to provide each of the stakeholders with a common lexicon and set of expectations on how to transform the use of data for decision-making and ultimately for the greater benefit of patients

- There are concerns about data relevance, depth and quality necessitating related improvements as well as the infrastructure for interoperability of RWD sources such as that being utilised in the IMI EHDEN project
- The proposal to develop the DARWIN platform is welcomed and it is recommended to leveraging existing expertise with other similar platforms e.g. FDA's Sentinel
- The importance of enhancing data quality at the point of care is stressed since any such enhancements will provide value to all stakeholders (clinicians, patients, researchers, HTA bodies, etc.)
- Addressing data privacy concerns is needed for appropriate and sustainable access to and use of RWD
- The ability to access data sources can also be challenging. For example, clarity regarding which stakeholder will have access to the proposed DARWIN platform would be welcome as well as a mechanism for sustainable funding. More generally, EFPIA encourages the EMA to recognise the importance of data sharing and facilitate a process for more formal data sharing agreements between and among stakeholders.
- There is a need for greater familiarity with and acceptance of study designs (e.g., registry-based randomized clinical trials) and modern causal inference methods (such as score methodology and methods for managing missing data or informative censoring) which necessitates development of best practices
- While technology is important it needs to be accompanied by enhanced digital literacy, competence and capacity building across the European Network and public institutions
- The objectives relating to Digital Transformation of the EU Network's scientific and regulatory processes may be influential in supporting a role for the EMRN in using new technologies to move from a system where the focus is on document-based, point in time submissions, to an approach based around the continuous availability of data as it is generated (e.g. using a cloud-based submission)
- There is the potential to transform the clinical trial experience, increase recruitment and retention, and generate RWD simultaneously
- Clinical innovation is focused on specific areas, such as e.g. the additional value that RWD/E provide to the design and feasibility aspect of clinical development, or e.g. the acquisition of data from the sources with limited replication (Patients, EMR, PHR, Labs, Claims, Telehealth, Biosensors) as patient-focused medicine development and decentralisation matures. RWE can also provide valuable supportive evidence when combined with pivotal clinical trial data to show the effectiveness of a given treatment.
- Key issues to be addressed: governance and access to the platform, interoperability with exiting platform (private/public)
- Strengthen collaboration with FDA and share learning from FDA's RWE Program, stemming from PDUFA IV legislation
- It is important that the network evolves and embraces progress together as a whole. Disparities between different competent authorities in terms of capacity and capability – regulatory and scientific, but also in terms of IT infrastructure should be evened out.
- Prioritise activities to promote across the Member States the uptake of electronic health records, registries, genomics data and secure data availability; guidance to assess the quality

of digital healthcare data should leverage Industry experience and existing international collaborations

- Support modernising the delivery of scientific advice but avoid creating an additional complimentary advice mechanism
- As such, global harmonisation in the development of policies, regulatory frameworks, technical standards etc. is an important goal to avoid divergence in a fast moving and dynamic field. Such harmonisation may not only help in the pooling of resources, capabilities and expertise but in ensuring The Network remains dynamic and able to meet the challenges of the 21st Century.
- There is a need to reflect on how the concept of big data/ real world evidence will be translated into applicability to the off-patent sector in view of referring to reference product evidence based on RWD and using RWD to support regulatory evidence for well- known molecules
- We call for a proportionate approach of the strategic use of big data in both the known and unknown territories to ensure that the progress and optimisation made in the known field can efficiently help redirect needed resources to the great challenges of the unknown
- Big data and real-world data should be further used to avoid unnecessary repetition of studies and generation of redundant data which already exist but may not be sufficiently well collected and analysed
- Using real world data as part of future product development strategies needs to be introduced in a scientific and pragmatic way, ensuring regulatory consistency across the lifecycle for medicines in terms of requirements and expectation, taking into consideration the available body of evidence as a key parameter for risk-management

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- The CIFA consortium project, working to secure support for the WHO C-TAP
- As part of EURORDIS's HTA Task Force we are involved in the HTx project and as an alternate member of PCWP for EURORDIS.
- We are currently working with our membership on "principles of patient-centred digital health", which will include reflection on ethical and effective use of patients' data, digital tools, and real-world data. We welcome further dialogue with regulators and other stakeholders in this arena.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Create digital programs to help citizen to self-manage their health conditions
- Digital transformation in drug safety
- The EAU leads the academic consortium on an IMI funded BD4BO project on prostate cancer and we are happy to share experience

- Promotion of the registration of clinical data by GPs to increase the development of Big Data useful to the individual GP, but also to the Regulatory System for pre-approval and post-approval decisions.
- FVE is involved in several projects and has organised several workshops on digitalisation in veterinary medicines. We are also looking at this aspect in veterinary education.
- PGEU has summarized the commitments of European community pharmacist as well as several policy recommendations on Big Data & AI in its Position Paper on Big Data & AI in Healthcare. In addition, PGEU has outlined its vision for community pharmacy 2030 in a paper which also addresses the vision and best practices related to the integration of real-world evidence and digital technologies in community pharmacy practice
- Many ECPHM members are working on the (harmoized) digital assessment of animal health, biosecurity, economics of animal disease in Europe, etc.

Cluster 3 (Research)

- ESMO is currently working on several projects in the area of big data and artificial intelligence and will share its findings with the EMA/HMA in due course. Additionally, ESMO and the EMA are collaborating with each other to tackle some of the topics mentioned in this focus area.
- Clinical Practice Guidelines are crucial for oncologists to deliver the highest standard of care to their patients.
- EPTRI is developing a paediatric Data Interoperability (including FAIRification) common service to facilitate and support use and re-use of data for research purposespaediatric biological data, to be implemented in collaboration with ELIXIR.
- ISPE has developed the Pharma 4.0 that will help pharmaceutical companies move towards a more fully automated environment that considers data integrity from the beginning of the design period based on a "Holistic" Control Strategy approach
- The Avicenna Alliance is working alongside EMA and FDA towards harmonization for the use of digital evidence.
- TEDDY has a specific expertise in ELSI issues including data protection issues addressing also paediatric paeculiarities. It is particularly engaged in developing activities/research in this field within EPTRI EU project.
- SIOP Europe is working on the development of a multi-national framework pooling the European paediatric oncology healthcare and research data and making it findable, accessible, inter-operable and reusable (FAIR) for science and innovation
- ARM looks forward to being part of an inclusive and solution-driven dialogue with the European Commission and other relevant stakeholders in shaping the path forward.

Cluster 4 (public body):

- EMA/EFSA systematic literature review AI pilot (already successful on a single bacterium pilot)
- Analytics through a shared ENVI data-lake and computational platforms, together with DIGIT and SANTE.
- A national project, called Management of indication-based patient registries for the monitoring of expensive pharmaceuticals, which has the aim to standardize patient registries

- ZIN is participating in the IMI Get Real II project, which has the aim to investigate the use of real-world data
- Ongoing discussions in relation to the above comment and the way forward with the EMA, CMDh and the Member States
- The Catalan Health Service has implemented a patient and treatment registry (RPT) for high complexity medicines.

Cluster 5 (industry):

- ACRO has recently established a specialized committee focused on technological innovation and the increasing digitization of clinical trials.
- We are actively working to develop EU real world data to support research and health authority evaluations of medicines in EU.
- We have engaged with EU data protection and governance experts to explore how high-quality RWD can be generated from EU citizens in accordance with existing regulations.
- Aetion is undertaking concrete actions that support the EMA/HMA Network's strategic goal of expanding the use of RWD to generate evidence for regulatory decision-making that benefits patients.
- EIGA has proposed 10 regulatory flexibility measures, which many countries accepted during CIOVID19, but which EIGA likes to work with regulators to tun these into more permanent regulations
- Work in couple of digital workgroups of associations/agencies/providers, participant in EMA UAT.
- GIRP has started a project to implement EDI communication standards between healthcare distributors and manufacturers in countries where there are no standards implemented yet, or where there is an appetite to increase standardisation
- Sanofi is actively involved in developing and piloting the Dynamic Regulatory Assessment concept with different regulators.
- Actively participating in Innovative Medicines Initiative (IMI) PPP consortia, e.g. Mobilise-D; Trials@Home; GetReal; Big Data 4 Better Outcomes; EHDEN; Electronic Health Records 4 Clinical Research;
- Working with the eHealth Stakeholders Group;
- Contributing to the 'Data Saves Lives' campaign to enhance trust and encourage sharing of health data for a positive benefit to health;

- Contributing to the EC's consultations on digital including those on the EHDS and the appropriate framework for the use of AI

- Interacting actively with the HMA-EMA Big Data Taskforce

- Working with EMA and other regulators on the future use and reliance on RWE/Registries, and has contributed to consultations, e.g.on the registries discussion paper, HMA-EMA Big data report, GDPR issues associated with secondary use of data; of note EFPIA has proposed Registries as a topic for a future ICH topic, and is currently considering revisiting its proposal to gain ICH acceptance.

- Joint publication with EMA and EUnetHTA in the British Journal of Clinical Pharmacology of an article on 'Regulatory and health technology assessment advice on postlicensing and postlaunch evidence generation is a foundation for lifecycle data collection for medicines' (Moseley et al, March 2020).

- Because data science, AI and digital healthcare are still emerging technologies, we suggest that adaptive/dynamic regulation be the preferred approach taken, as described in the Strategy. Achieving this is by no means simple and, at its core, should include more frequent and regular dialogue with stakeholders to evaluate progress and revise planning. An optimised, integrated process for scientific advice delivery is required, ensuring alignment with HTA bodies.

- Expertise, and not technology, may prove the most significant rate-limiter, with funding coming a close second.

- The ERMN should first assess the current capacity and capability for biostatistics and data analytics. The proposal for clusters of expertise is a practical means to build capacity quickly. EFPIA would advise using these clusters then to establish a community of biostatistics and data analytics/AI experts across regulators, medicine developers and academia.

- Support for continuous education of all stakeholders (patients, physicians, healthcare decision makers, etc.) and communications, on the potential added value of digital transformation to society.

- While all of the objectives identified are important, it is likely that there are some fundamental building blocks to digital transformation that have to be initiated first, such as Goal 4, that will establish the correct governance and Goal 1, which will enhance the availability of relevant data.

- On-going work on RWD-RWE and its application to non-prescription medicinal products; active participation in the EMA and HMA telematics working groups, e.g. on SPOR/IDMP an ePI.

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Strategic focus area: Innovation

Question 6: Do the objectives adequately address the challenges ahead?

Individual members of the public, patient or consumer organisations and advocacy groups (N=24) raised several individual comments, including:

- Develop a regulatory framework for AI and machine learning (distinct from Big data)
- Expand capability with outsourced expertise
- Identify the collaboration with notified bodies as an objective
- Improve communication on the evidence and uncertainties
- Prioritise full implementation of the Clinical Trial Regulation
- Develop EU guidelines on trial designs, statistical methodology, authorisation processes, and clinical use for pharmaceutical and diagnostic co-development in personalised medicines
- Focus on gathering robust evidence early in the approval process
- Include reference to the European Reference Networks
- Pool resources and enhance collaboration for innovation in paediatric oncology
- Invest in innovative trial design in paediatric rare diseases
- Clarify what is meant by 'innovation' - new AND better, aligned with patient unmet needs

Amongst comments received from **healthcare professionals, veterinarians and their organisations** (N=15), the following individual points were raised:

- Develop guidance on validation methodology for innovation in data generation
- Direct the innovation agenda towards public health needs
- Harmonise global regulatory requirements for novel excipients
- Provide additional specificity to mitigate the environmental risks of pharmaceuticals
- Promote cross-innovation between Human and Vet fields
- Clarify what is meant by 'innovation' - new medicines but also new clinical trial design

The cluster gathering **Academic researchers, learned societies, European research infrastructures and other scientific organisations** (N=15) submitted the following individual comments:

- Enable and leverage research and innovation in regulatory science both in the human and veterinarian fields
- EMA should play an important role in a clinical trials transformation initiative comparable to https://www.ctti-clinicaltrials.org/
- Greater focus on the involvement of a wider group of actors and boosting innovation in the fields that lack commercial incentives and are less attractive for private companies
- Expand on how innovation issues might be different for antibiotics
- Cross-refer to core recommendations and set of actions included in the EMA Regulatory Science Strategy to 2025 (RSS2025)

- EMA to assume a more proactive role in prioritizing the use and development of non-animal methods

Public bodies including **EU regulatory partners and institutions, health technology assessment bodies and payers** (N=12) raised the following points:

- Develop IT Tools for the regulatory assessors to analyse the clinical data in-depth
- Foster robust quality by design and methodologies, tools or guidelines in innovation
- Develop methods for properly assessing benefit-risk of ATMPs (as opposed to promoting ATMPs/ PRIME)
- First goal should be to leverage research into regulatory science
- Focus on how medicines agencies should increase their resources to best cope with the difficult "questions" arising from the arrival of complex therapies at the time of marketing authorisation, but also at the time of pricing and reimbursement
- Foster innovative managed entry agreements and ensure an affordable and risk-mitigated funding of the innovation

Within the pharmaceutical industry cluster, gathering comments received from **trade associations, individual companies and SMEs** (N=34), the points raised individually included:

- Separate regulation for combination products
- CTIS will need adaptation/flexibility to readily accommodate future innovations in clinical research and the regulation of clinical trials
- Provide specific steps how the network aims to enable innovation and, where feasible, relax the rules & regulations that currently hinder progress
- Formulate exact plans how to reduce the average marketing authorisation application review time
- Foster innovation also for known active substances in new indications or new populations
- Approach is still from the current areas (e.g. NITAGs and vaccines), the option to combine or create new bodies that oversee these new options from a non-traditional viewpoint is not addressed
- Scientific advice for companies should be an on-going process during product development
- Focus on more harmonized guidance, standards and transparency from regulators on the use Real-World-Evidence which supplements clinical trials
- International collaboration with other, major authorities such as US FDA (CERSI), NMPA, and relevant groups in the United Kingdom (UK) is missing
- Include rare disease and paediatric populations for unmet needs
- Innovation in biosimilar medicines includes new administration routes, traceability, and devices innovation beyond pharmaceutical/therapeutic innovation
- Encourage the use of new types of clinical trials
- Allow greater use of data from real world use
- Allow ongoing dialogue and discussion about a treatment throughout development

- Simplify how medicines and other healthcare products are regulated
- Clarify gaps in regulatory framework (including GMP expectations)
- Include National immunization technical advisory groups (NITAGs) as stakeholders
- Ensure expertise in the European regulatory network to guarantee access to PRIME to all category of products, and in particular for vaccines
- Extend current SNSA pilot to ensure all EU MSs participate and more than 2 NCAs can be involved in a single consultation
- Align and coordinate different contributors e.g. CTFG, national agencies' clinical trial units and ethics committees, SAWP, and/or CHMP who need more resources, more diverse skill sets and/or closer collaborations with other assessment bodies.
- Develop EU harmonised standards and requirements for complex clinical trials and remote inspections
- Goals and objectives proposed to be developed within a multi-stakeholder network (regulators, HTA, academia, patients, industry)
- Develop a flexible regulatory system that is integrated with medical device regulation
- Biomarker qualification framework should be improved and harmonised with US FDA
- Collaboration with all stakeholders to accelerate the development of a competitive, innovative and fast progressing regulatory system
- Foster talent recruitment in close collaboration with academia
- tailored approaches for value added generics; develop similar guidance as that for biosimilars
- Clarify application to veterinary medicines
- EU-level model for horizon-scanning not considered to be a high priority objective; EMA portfolio review meetings could be expanded and enhanced
- Approach is in its infancy and value not yet been demonstrated; reconsider whether the strategy needs to 'foster' its further development.
- Authorisations based on limited evidence identified as a challenge but not addressed in goals or objectives
- Focus on innovating clinical research as a priority; foster collaboration in complex clinical trials
- Coordination of scientific advice across the EMA Committees and national competent authorities (NCAs) should be strengthened and inclusion of MHRA considered
- Goals are essential to fulfil the promise of radiopharmaceuticals and bring highly targeted and personalised treatment to numerous EU cancer patients
- The objective should include evaluation of biomarkers impact on clinical outcomes in collaboration with HTAs, payers and patients
- Dedicated expert group discussions, routed in the reality of clinical practice to help EMA and downstream regulators to align views on ATMP development
- Ensure Hospital Exemption for ATMPs is used in a responsible, science-based, and harmonised way across Europe

- Leverage collaboration with patients, healthcare professionals, academia and international partners and involvement of HTAs and payers
- Expansion of PRIME scheme to new indications of existing products
- Develop a fast lane approach for PRIME products: shorter timeline for eligibility and kick-off meeting, continuous access to EMA contact person, rolling opportunity to receive advice on product development
- Use Regulation 2019/6 to foster new technology and innovation in the animal health sector
- Enhance communication with VMPs developers to ensure faster and better dossier development
- Tailor regulatory guidance on application of innovative solutions to veterinary medicines
- Develop coordinated evaluation pathway for the assessment of medical devices, in vitro diagnostics and borderline products
- Strengthen the Network's expertise in handling more complex designs, including the use of data analytics and real-world data
- Strengthen international collaboration on topics addressing generation of RWD
- Focus on advancing use of RWD and genomic data in research and development in collaboration with Industry stakeholders
- Clarify whether drug developers will need to make the data collected via wearable devices/app available to the Network to perform large scale analysis using Machine Learning/Artificial Intelligence
- Creation of an integrated evaluation pathway for both medicine-medical device combination products and medicines that are developed and used in combination with companion diagnostics
- Fitness for purpose of the existing SA procedure for off patent versions of existing products with a different scientific approach to development needs to be factored into the strategic plans of the regulatory network
- Clarify or define data 'thresholds' – e.g. what is the data that needs to be generated by the sponsor in order to make meaningful scientific advice possible
- Build further on tailored scientific advice to support step-by-step development of new biosimilar medicine candidates as well as adapt early dialogue opportunities for value added medicines developers that innovate on well-known active substances

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Individual members of the public, patient or consumer organisations and advocacy groups (N=24)

- Research funding for plant extract products

- Use opportunity to support existing technology pools and responsible licensing methods, such as the WHO's C-TAP (rather than 'developing large EU investigator networks' and the associated 'public infrastructure')
- Explain how the EU horizon scanning being currently developed in the EU Innovation Network will interact with other existing horizon scanning models, what type of information will be shared through this new process, which organisations will be involved, and how will EU data be properly stored and used
- Explore how IP protection tools, innovation stimulus mechanisms and socially sustainable licensing could be used to tackle challenges like pandemics, antimicrobial resistance, and medicines shortages
- Develop more concrete plans for harnessing innovation and how the EMAN will play an active role in encouraging innovation
- Invest in comparative trials, novel clinical trial designs and industry neglected areas of research such as treatment optimisation research, repurposing and multimodality combination treatments
- Support independent (non-profit) clinical research for added therapeutic value for patients (overall survival and quality of life)
- Evaluate clinical evidence provided by public researchers and non-profit organisations, e.g., related to new indications
- Work with sponsors to enable extension product indications based on additional data from public/non-profit research (shift from off-label use to on-label)
- Map innovation needs per disease area and avoid 'more of the same' medicines ('better' instead of 'new')
- Define better the personalised medicines concept
- Work on innovative trial designs and methodologies beyond basket and umbrella trials (mostly used in oncology) and elaborate on which actions could be envisaged to conduct clinical trials with adequate numbers of participants
- Revisit the status of designated orphan medicinal products and prepared annual reports to compare designations and MAA
- Elaborate further on collaboration with ERNs
- Establish structured collaboration with industry innovators, patients and healthcare professional (including academia) for horizon scanning, identifying real needs for innovation and discussions on benefits and risks of new treatments and technologies
- Clarify definition of 'innovation'
- Specify how Patient involvement in evidence-generation will be prioritised and implemented
- Invest in communication and health literacy

Healthcare professionals, veterinarians and their organisations (N=15)

- How to register new types of health services such as AI algorithms embedded in IoT (Internet of things) or medical devices
- Explain status of dependence / disability management tools for aging population

- Address post-marketing evaluation of safety and efficacy in drugs with early access and diseases with high innovative potential (e. g. multiple myeloma, lung cancer and others)
- Focus on managing the impact of Brexit on the availability of innovative treatments across Europe (both for UK and countries highly depend on the UK market such as Ireland, Malta and Cyprus)

Academic researchers, learned societies, European research infrastructures and other scientific organisations (N=15)

- Ensuring guidance and legislation fits innovative clinical trial designs and there is sufficient staff to review, comment and understand these designs
- Extend collaboration with the EU-PEARL consortium on its innovative framework of Integrated Research Platforms
- Develop a policy framework for in silico medicine
- Address the lack of incentives for enhancing the role of computer modelling and simulation (CM&S) in core medicinal product legislation
- Address link between innovation and patient safety
- Promote use of CM&S towards the adoption of personalised medicine
- Bridge the gap between the scientific community, industry and policymakers by advocating for policy changes that take scientific and market developments into account
- Promote a holistic assessment of innovation in medicine development and research encompassing not only the scientific perspective, but also clinical benefits, economic / health-outcome improvements, ethical, legal and regulatory issues while guarantying the respect of fundamental and patients' rights (particularly in research for paediatric medicines)
- Improve the paediatric regulatory framework and its implementation.
- Promote alignment between EMA and FDA in paediatric developments, especially paediatric oncology
- Mirror FDA's "right to try" act for life threatening diseases and develop a legal framework to access investigational drugs at the European level (not at the MS level)
- Pay greater attention to translating currently existing academic knowledge into products (funding drug discovery research, translational medicine and clinical development) as well as to supporting global market shaping activities for new antimicrobials
- Extract lessons learnt from COVID-19 in addressing upcoming health crises and ensuring end-to-end investment for areas with high unmet need, such as AMR
- Specifically incentivize Industry to develop new methodologies that replace animals and remove regulatory barriers to use non-animal models

EU regulatory partners and institutions, health technology assessment bodies and payers (N=12)

- Explain the Network vision on tumour agnostic therapies and ATMP's
- Consider access to appropriate expertise in all areas of medicines evaluation (quality, safety, efficacy)
- Explore changes to regulation with non-binding scenarios before implementation

Trade associations, individual companies and SMEs (N=34)

- Establish an expert group on data science/artificial intelligence and develop collaboration with medical device experts
- Consider explicit recognition of the need for decentralised clinical trials to reflect trial participant needs and reduce inconvenience
- Establish formal meeting pathway for developers of digital tools or real-world data to obtain issue-specific scientific advice within specified timelines
- Develop guidance and incentives for early patient engagement
- Promote early dialogues and PRIME
- Develop guidance for real world evidence gathering
- Innovative drug/device combination products and drugs & CDx for personalised medicines should be favoured by pathways, guidance, dedicated scientific advices including interactions with EMA &/or National Competent Authorities together with Notified Bodies
- Facilitate clinical trial application for combination products with consolidated review of drug and devices reviewers
- Revision of MUMS policy (free scientific advice, low administrative burden, reduction of fees, etc.)
- Promote diagnostic and in particular functional and molecular imaging
- Do not limit Innovation to new chemical entities or new biologicals; also consider off patent sector and new or improved clinical use of older molecules and new (digital) technologies
- Revisit biosimilar development recommendations in order to increase the emphasis on non-clinical testing
- Align and coordinate different contributors e.g. CTFG, national agencies' clinical trial units and ethics committees, SAWP, PDCO and/or CHMP to assess integrated therapeutic solutions
- Ensure sufficient statistical and computational capacity to review protocols of innovative trials
- 'Foster innovation in CTs' should be elevated from an objective to a theme or goal with its own specific objectives
- Elaborate further how different goals and objectives will contribute to greater advice agility and efficiency to reflect the changing pace and process of innovation
- Interlink the concepts of RWD/RWE to innovative CT design and integrated advice throughout the strategy
- Foster international alignment to address specific questions on new technologies
- Promote upskilling of all participants in the healthcare system, in particular on Software Applications as Medical Device (SAMD) used in combination with Medicinal Products
- Define whether and how AI/ML will be used by regulators in their decision making, or by other relevant stakeholders analysing Clinical data and publishing such assessments (Academia, HTAB). The same governance should be applied for all these stakeholders
- Increase acceptability of RWE to support decision making throughout the product life cycle by addressing technical questions and public concerns on health data use

- Include an objective within the Innovation theme to develop innovative and flexible approaches to enhance the scientific advice process
- Implementation of the RSS2025 actions addressing innovation beyond regulatory process and including manufacturing technologies and new product types
- Establish a permanent EMA-HTA Framework
- A new acceleration model or a revised PRIME scheme should be considered
- Further clarification of the pathways to access IVDs under the IVDR are required to ensure access to innovative targeted therapies
- Address concern that clinical trials with ATMPs will fall out of the EU Clinical Trials Regulation (CTR) process owing to unrealistic response timelines as well as a submission portal that is not fit for purpose for ATMPs
- Explore whether GMO requirements are appropriate given the current state of knowledge
- Update the regulatory environment for radiopharmaceuticals and ensure the uptake of centrally authorised radiopharmaceuticals in Europe
- Develop a new strategic initiative on Complex Innovative Clinical Trial Designs
- Build the right statistical expertise and computational capacity
- Review the experience with performing clinical trials remotely during the COVID pandemic and agree on the use of (remote or hybrid) decentralised CT approaches in a post-COVID setting
- Better define and facilitate the use of qualification of digital technologies for medicines development
- Continue to integrate advice of members from SAWP, special disciplines WPs, CAT, COMP. Continue to improve CHMP- PDCO- COMP- CAT- SAWP alignment
- EMA Scientific advice and National SA to be aligned via better connections between SAWP members and respective NCAs
- Integrated multidisciplinary advice (IVDs, MDs, including software MDs); increase collaboration with notified bodies
- Systematically integrate the voice of other stakeholders to ensure SA can be implemented in the reality of the clinical setting and ensures patients access (patients, HCPs, CT NCAs, ethic committees, HTAs and payers)
- Creation of an integrated evaluation pathway for both medicine-medical device combination products and medicines that are developed and used in combination with companion diagnostics
- Clear guidelines are needed before the Medical Device Regulation is implemented in 2021
- Extended to include standardisation of framework to generation of robust surrogate methods – particularly around demonstrating equivalence where bioequivalence methodology is not applicable (locally acting locally applied products)
- Ensure that regulatory pathways which support the lifecycle of innovation are in place in time to enable a multi-source environment when the market exclusivity is over
- Adapt SA procedure for off patent versions of existing products (particularly biosimilar medicines)

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Individual members of the public, patient or consumer organisations and advocacy groups (N=24)

- CIFA consortium project; HAI guidelines on socially sustainable licensing policies; EUnetHTA
- Use ECL expertise and network as an EMA eligible organisation
- Use Lymphoma Coalition work in patient evidence generation
- EURORDIS's ePAG support for ERNs
- PARADIGM project: https://imi-paradigm.eu; The European Patients' Academy on Therapeutic Innovation (EUPATI): https://eupati.eu

Healthcare professionals, veterinarians and their organisations (N=15)

- IPEC has developed proposals as to how a master file type for novel pharmaceutical excipients could be operated within the EU / EAA
- EAU research foundation funds individual clinical trials; its clinical guidelines and journal are conduits for translation of innovation into clinical practice where real benefit to patients can be demonstrated
- ESOP contribution to consultations and surveys
- ESMO Scale for Clinical Actionability of molecular Targets (ESCAT); ESMO, EORTC and EACR created the Clinical Academic Cancer Research Forum (CAREFOR); ESMO's Clinical Research Observatory (ECRO) is addressing the issue of rationalising the administrative and bureaucratic burden in clinical research; Rare Cancers Europe multi-stakeholder initiative

Academic researchers, learned societies, European research infrastructures and other scientific organisations (N=15)

- EATRIS is Co-Coordinator of the EU-PEARL ("EU Patient-cEntric clinical tRial pLatforms") project - strategic partnership between the public and private sectors to shape the future of clinical trials
- EPTRI is working on creating models and procedures to enhance paediatric research and to foster innovation in paediatric drugs development
- ISPE is advancing the scientific and regulatory understanding of many new manufacturing technologies including continuous manufacturing for small and large molecules, advanced therapy medicinal products (ATMPs), and portable and point of care manufacturing
- Avicenna Alliance is calling for Good Simulation Practices in the EU; position paper on "AI and Big Data effective readiness, a privacy-enhancing pathway to data access"
- TEDDY is member of both c4c and EPTRI projects that are producing models, procedures for implementing innovation in the paediatric drug developmental process; TEDDY is also in charge of addressing ELSI aspects
- SIOPE is involved ACCELERATE platform – a Multi-stakeholder paediatric strategy forums to define unmet medical needs and prioritise medicinal product development by providing a multi-

stakeholder engagement with patients, parents, academia, regulators and industry.; Rapid access to expertise in the field of paediatric oncology, biology, new drug development and regulatory science

- ARM is currently updating a series of recommendations to streamline clinical trials approvals with investigational medicines consisting of and containing Genetically Modified Organisms (GMOs); updated position paper on the implementation of hospital exemption (HE)
- TB Alliance is member of Critical Path to TB Drug Regimens initiative that aims to accelerate the development of novel regimens as well as is an associate partner in the European Innovative Medicines' AMR Accelerator Programme
- GARDP can provide support and contribute to innovation objectives from the AMR field

EU regulatory partners and institutions, health technology assessment bodies and payers (N=12)

- EFSA is currently elaborating its 2027 Strategy and looking forward to stronger collaboration on a number of proposed objectives
- ZIN is evaluating its health care package management activities in order to build a future proof framework for HTA
- Notified Body Coordination Group (NBCG) - Notified bodies are undertaking several activities that could benefit from enhanced dialogue with stakeholders in the EMA/HMA network, e.g. implementation of MDR provisions related to drug-device combination products could complement the activities of EMA/HMA stakeholders in this area
- Spanish Ministry of Health is involved in actualization and improvement of procedures for Therapeutic Positioning Reports of new drugs/indications (cost-effectiveness and budgetary impact)
- TEAM NB working on the implementation of Art 117 of the medical device regulation, have included stakeholders from EMA to participate in the preparation of guidance and position papers towards the implementation of the new requirement to provide a Notified Body Opinion for single integral combinations
- The EDQM Committee of Experts on Minimising Public Health Risks Posed by Falsification of Medical Products and Similar Crimes (CMED) has initiated the creation of a network of experts in Borderline Products that aims to connect national expert and to facilitate exchange and advice between them
- AIM is engaged in the European Medicines Agency/Payer community meetings, in order to explore synergies and foster mutual understanding and cooperation to help improve timely and affordable access of patients to new medicinal products

Trade associations, individual companies and SMEs (N=34)

- EFPIA would welcome the opportunity to share more detailed proposals for advancing improvements and strategic initiatives across the Innovation Theme; Actively participating in Innovative Medicines Initiative (IMI) PPP consortia (e.g. Mobilise-D; Trials@Home; GetReal; Big Data 4 Better Outcomes; EHDEN; Electronic Health Records 4 Clinical Research; Gravitate Health)

Strategic focus area: Antimicrobial resistance and other emerging health threats

Question 6: Do the objectives adequately address the challenges ahead?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Appreciation was expressed of the seriousness with which the EMAN strategy approaches the issue of antimicrobial resistance, but also more details was requested of the objectives outlined in Theme 4. It was further pointed out that some of the work may fall under the remit of other agencies (ECDC)
- The strategy should clearly outline the importance of rational use of existing antibiotics, alongside a push for the creation of new antibiotics
- The main challenge to overcoming AMR remains the lack of interest in the pharmaceutical industry in developing new and effective antibiotics due to poor market returns. Suggestion is made that the EMAN explores possibilities to connect the market authorisation with antibiotic development.
- Concern was expressed that the strategy mentions the contribution of not-for-profits (NFPs), thereby already somewhat accepting a failure to force the private sector to act
- New R&I models should be explored, including de-linking the R&I costs from the price of a medicine, innovation inducement prizes as well as socially responsible and other pro-public forms of licensing. Open source data and open science should be standard practice.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

A number of further important points were raised by the cluster group as outlined below:

- ECDC/EFSA/EMA proposed harmonised outcome indicators in relation to One Health should be used
- Collected data on antibiotics should be analysed at farm level and by species
- The network should also play a role in reporting and analysing antibiotic data on the human side as well as the veterinary side
- Goal 3 "Ensure regulatory tools…" should not only focus on veterinary medicines, but fully encompass human medicines as well. It should stress the need to support research into alternatives to antibiotics such as phage therapy.
- Continued global cooperation, including with the WHO, on global antibiotic innovation is needed. The global role of the Network should however not be limited to innovation but should encompass all aspects related to AMR and antimicrobial consumption.
- The role of ERA should be included in the strategic goals, not only be mentioned in the strategy text
- The network should outline a plan for how to reduce the EU sales of antibiotics for farm animals by 50%, in line with the goals in the Farm to Fork strategy

Cluster 3 (research):

The following points were raised by individual stakeholders in the cluster group:

- AMR won't be successfully tackled until drug-resistant forms of TB are fully addressed. Tuberculosis is the single largest source of AMR: globally representing one-third of the world's AMR burden. It is important to ensure that tuberculosis is sufficiently emphasised in the AMR discussion at the highest decision-making level.
- Very little mentioning of paediatric populations, this should be rectified
- Any regulation of antimicrobial use must be coupled with initiatives that support accessibility and uptake of guidelines by targeting tools to prescribers
- We encourage that this data is extended to include drug-bug combinations and patient outcomes following antibiotic treatment to ensure a patient-centred view. Data should be kept into a repository that is easily accessible and supports use of this data in decision-making processes.
- We encourage that work within the environmental domain is not limited to the interface with use of antimicrobials in animals and suggest that interface with human health and waste flows are also considered

Cluster 4 (public body)

The following points were raised by individual stakeholders in the cluster group:

- Fostering surveillance on the emergence of AMR is outlined as an objective for human medicine only and should be extended to veterinary medicine
- Suggest amending the current objective as follows: "Foster research on better understanding of causality between use of antimicrobials and AMR and of co-selection of AMR by use of biocides and feed additives"; this requires standardization and harmonization of data requirements for resistance and consumption data
- There is also a need to foster the availability of interpretative criteria and their proper use in human and veterinary medicine. In the implementation of the strategy it should therefore be considered that pharmaceutical companies provide such data for the calculation of interpretative criteria - and how to do so
- Alignment with the new EFSA Strategy 2027 under development is needed
- Public strategies and policies for promoting research in this field as a goal in public health are needed
- It is important to ensure - even in the case of an emergency - that only safe and effectiveness medicines are authorised

Cluster 5 (industry):

The following points were raised by individual stakeholders in the cluster group:

- Products indicated for AMR are considered as orphan products. Regulation 141/2000 applies, the Agency should facilitate adoption of guidelines and training applying existing incentives, and creating innovative models to answer unmet needs.
- Approval routes for Microbiome related products should be clarified and facilitated, dedicated pathway (FDA/LBP), working groups and consultations, EMA/EFSA interaction needed for drug/food borderline products

- Campaigns should be encouraged for alternative treatments of uncomplicated infections (e.g. herbal medicinal products in respiratory tract infection or urinary tract infections) which are not yet in a need for antibiotic treatment
- Streamlining of development of new antibiotics is mentioned in the summary but should also be covered by the objectives. A dialogue between EMA and developers is needed and a tool like the US QDIP (Qualified Infectious Disease Product) should be examined
- In addition to listed objectives development of SMEs should take place and a system like the US NTAP (New Technology Add-on Payment) should be put in place for the EU
- More focus on actions wanted in this theme area
- The main elements are captured in the strategy, all of them are critical to work on
- The use of identified best practises should be mandatory
- Renewed focus on addressing AMR needed, increased multi-stakeholder cooperation needed at EU level
- Physician training and treatment guidelines are important parameter to manage Antimicrobial resistance while preserving existing therapeutic options
- Objective 4.4 is not in the remit of the network
- Make use of existing regulatory framework for drug development for serious diseases also for AB and other class of agents
- Measures and guidelines supporting a shift towards home therapies should be supported as appropriate
- It is important to have an EU-list of priority pathogens that guide developers to target the right unmet needs, as well as an alignment on the value demonstration amongst all concerned stakeholders
- There must be a clear differentiation in the strategy between antibiotic, antimicrobial and antiparasitic resistance
- Efforts should be focusing on medically important antibiotics (for humans) as defined by WHO, while taking into account the veterinary sector's specific types of administration and essential treatment needs
- Monitoring resistance in veterinary pathogens, not only in zoonotic and commensal bacteria, should be part of the strategy, as is mentioned in the annex for human pathogens
- Clinical decision making in veterinary use of antimicrobials should be the responsibility of veterinary professional organisations with relevant clinical expertise, not the agencies
- It is important that sufficient resources are dedicated as part of the EMRN Strategy to 2025 in creating an adapted regulatory package and ways of dialogue between developers and regulators so that development of these alternatives are encouraged. This includes taken the Farm to Fork strategy into account and to set up an appropriate regulatory framework for alternative treatments.
- An additional strategy around accountability and progress reporting should be incorporated to ensure success. We believe that use of in vitro diagnostics at healthcare practices and pharmacies can significantly reduce inappropriate demand for antibiotics.

- Very little is proposed regarding the maintained access of the existing antibiotics currently available on the market and dominantly produced and marketed by the off-patent sector

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Involvement of patients' and consumers' organisations in shaping communication and health literacy strategies is essential
- There is a need to spread awareness among the population on the issue, and promote correct behaviours
- Funding of development of lab tests for Lyme disease and other tick-borne diseases are needed
- Funding of research into plan extracts that can replace antibiotics are needed
- There is a need to focus on the SmPC and PIL as sources of information on correct and rational use of antibiotics

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Adequate monitoring of prescribing, especially in animal husbandry
- The management of surpluses and residues of medicines and health products is important. Action protocols must be created to avoid contamination of the environment.
- Suggestion to remove the following sentences "Thus far, the particular involvement of regulators has been limited. Joint efforts of human and veterinary stakeholders have been scarce and often hampered by conflicting sectoral aims. Ambitions and measures on AMR have thus appeared more aspirational than realistic in many..."
- WHO is mentioned several times, it would be good to also mention OIE, the World Animal Health Organisation, which also works extensively on AMR
- Arrangements should be made to ensure that essential antibiotics can be maintained on the market. Also, the development of new antibiotics should be promoted. In case this is possible, EMA should consider providing 'fast access routes for new antibiotics.

Cluster 3 (research):

- The strength & quality of evidence supporting marketing authorisation decisions on the human side is lacking
- Work remains to be done on strategies to support the varied needs of developers in this area. In addition to the topics already raised as part of the text of Goal 5, other topics to be covered should include strategies for products focused on rare pathogens, strategies for products focused on prevention, as well as other areas of concern raised in conversation with these stakeholders.
- Attention should be given to successful national pilots on incentives, also a way to cover the cost for required paediatric trials should be considered

- The EMA and its network should make it a priority to collaborate with the WHO, including through the WHO's Prequalification programme and the Collaboration Registration Procedure on how to address this serious problem of lacking registration of both new and old antibiotics
- It is important to ensure greater collaboration and integration of AMR programmes with the disease-specific programmes such as TB

Cluster 4 (public body):

- The marked lack of veterinary-specific clinical breakpoints (CBPs) is impeding implementation of the prudent use of antimicrobials in the European Union. We propose that a sentence be added to this strategic document to recognize this functional and organizational problem.
- We propose adapting the following paragraph: In order to address the potential impact of environmental residues of antimicrobial medicines on the emergence and spread of AMR, we will explore the Environmental Risk Assessment (ERA) in more depth
- Measures should be taken to ensure that environmental aspects of API production are taken into account

Cluster 5 (industry):

- There is a need to develop new antimicrobial preparations
- EMA should be more open, as soon as possible, to get input from industry as other agencies do (i.e. FDA invited us to attend a 2-day meeting on innovative anti-infectives). Reluctance from EMA on this point is more than worrisome.
- Use of autogenous vaccines in battling AMR should be addressed
- Review of SmPCs of old antibiotics should result in harmonisation
- Harmonised approach for disposal of non-used medicines is needed
- Over usage of AB in animals should be strongly reduced
- The EMRN should ensure the breadth of this scope of AMR is explicitly captured within the strategy. In this respect, the focus of Goal 3 should not be restricted to veterinary medicines but should also include human medicines and vaccines.
- The EC should develop a European priority pathogens list, taking into account the WHO list, following a discussion with all relevant sector stakeholders, including the private sector
- Alignment of the AMR definition with EC suggested (including antifungals, antivirals and antiparasitics)
- Increasing knowledge on antimicrobial resistance and antibiotic use in human medicine by data collection
- Promoting the prudent use of antibiotics and reinforcing patient education on the use of antimicrobial medicines
- It is crucial to ensure a continuous supply of high-quality antibiotics in the EU and to avoid shortages that can put patients' lives at risk
- A new model of research and incentives is needed, which needs to be un-linked from the volume of sales in order to contain any further spread of AMR
- The fact that unused antibiotics are not being properly disposed of needs to be tackled

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Individual members of the public, patient or consumer organisations and advocacy groups (N=xx)

- EPHA along with Health Care without Harm are co-hosting the Secretariat of the MEP interest group to tackle AMR in the European Parliament. EPHA also leads the AMR stakeholder network.

Healthcare professionals, veterinarians and their organisations (N=xx)

- We as EFPC try to collaborate with WONCA and UEMO in primary care to promote prudent use of AB and limit use of AB for which there is no indication.
- FVE works together with CPME, the European Doctors organisation and CED, the European Dentist organisation to promote responsible use and is a member or in the core management group of several EU projects in the field of AMR. Also, member of the One Health Network.
- PGEU has produced an overview of best practices of community pharmacists across Europe on fighting AMR in the 2017 PGEU Best Practice Paper on AMR: https://www.pgeu.eu/wp-content/uploads/2019/03/170629E-PGEU-Best-Practice-Paper-on-AMR.pdf We plan to release an updated version of these best practices in November 2020, which could support EMA and HMA in its objective to raise awareness about best practices on AMR. Each year, PGEU and its member organisations are also actively participating in the European Antibiotic Awareness Day (EAAD) and World Antibiotic Awareness Week (WAAW). EMA and HMA activities could further align with these initiatives as a mean to promote responsible use of antimicrobials at national and European level.
- EAHP is working with its members on increasing the uptake of stewardship teams in hospitals. The position paper of EAHP serves a basis for this activity: https://www.eahp.eu/sites/default/files/eahp_position_paper_on_amr_june_2018_1.pdf
- The EU JAMRAI initiative.

Academic researchers, learned societies, European research infrastructures and other scientific organisations (N=xx)

- ReAct has published the public health principles that should govern any public funding spent, to secure equitable and sustainable access to new antibiotics (https://www.reactgroup.org/wp-content/uploads/2019/10/Public-health-principles-to-ensure-sustainable-access-to-novel-antibiotics.pdf). ReAct will also publish a report detailing what a "end-to-end" model for development of new antibiotics should contain in order to deliver affordable products and enabling appropriate stewardship in Q4 of 2020.
- TB Alliance is a not-for-profit organization dedicated to the discovery, development and delivery of better, faster-acting and affordable tuberculosis drugs. TB Alliance is associate partner contributing to the Innovative Medicines Initiative AMR Accelerator programme that is focused on antimicrobial resistance and innovation in clinical trials. TB Alliance is working with its partners towards the development of new and improved therapies that will be critical to ending TB and curbing AMR.
- As a global initiative GARDP can support and contribute to all of these objectives from the AMR field and be an important partner to help fulfil these objectives.
- We have supported work by UK Office of Health Economics to explore how HTA processes might be improved to properly define and embody the value of novel antibiotics. We are

actively working with the pharmaceutical industry to make their surveillance data openly accessible on the AMR Register. This includes data at the European level that if made available through the AMR Register might be accessed and used by countries. We are working in partnership with pharmaceutical industry to improve AMR surveillance data capture and use to improve patient care in LMICs, including improving the use of surveillance data to guide infection prevention and control in healthcare settings.

EU regulatory partners and institutions, health technology assessment bodies and payers (N=xx)

- Our goal is to ensure the short-term sustainability of VetCAST, the EUCAST Subcommittee aiming to deal with all aspects of antimicrobial susceptibility testing of bacterial pathogens of animal origin. Currently VetCAST relies on non-sustainable financial support of academic origin. We continue to support this group with projects of academic interest thanks to a European COST action (ENOVAT, see WG3) or national (French DGAL) grants, hoping that VetCAST will find its way to become part of the European network dedicated to prudent use antimicrobials
- Alignment with the EFSA strategy, details will be available in the next months

Trade associations, individual companies and SMEs (N=xx)

- Vaccines Europe has developed a document listing the main bottlenecks to the rapid development and authorisation of COVID-19 vaccines. Challenges and proposals highlighted in this document should be taken into account by EMRN. Vaccines Europe is ready to share its analysis with EMRN and contribute to the reflection on learnings.
- Bayer supports the AMR Action fund initiative https://amractionfund.com/ and proposes that Regulatory Authorities in EU should work closely with this initiative to foster Research in this area.
- Industry is already undertaking the "eERA" (extended ERA) initiative as part of the PiE Inter-Association Taskforce that supports a balanced approach to extend and improve the current Environmental Risk Assessment.
- AMR Industry Alliance

Strategic focus area: Supply chain challenges

Question 6: Do the objectives adequately address the challenges ahead?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

The following points were raised by individual stakeholders in the cluster group:

- Strategies are needed for an increase in micro-supply chains and distributed manufacture particularly for ATMPs and cell and gene therapies
- Increase focus on collaboration with academia for training on the importance of quality aspects of medical products at all levels of education in the life sciences arena

- Proposal for inclusion of risk-assessment evaluations from manufacturers of the API
- Further explanation to which regulatory barriers are considered problematic, how they could be avoided, and the ramifications of this on safety and efficacy
- Further information on how the network plans to tackle shortages due to commercial pressures
- Early warning systems should be created on medicine shortage at both national and EU level building on experience from the SPOC system. Focus should be on both prevention and crisis management
- The EU should set up a system for collection of plasma based on best practices from Austria, Czech Republic, Germany and Hungary

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

The following points were raised by individual stakeholders in the cluster group:

- The importance of pharmaceutical excipients (excipients) is not explicitly recognized within the objectives related to supply chain challenges. Many of the objectives targeted at APIs should be extended to excipients, particularly novel excipients.
- Initiatives such as enhancing inspectors' capability and understanding of excipient GMP / GDP requirements should be enhanced to better describe how the reliability of the sourcing of starting materials can be achieved
- EU / EEA legislation does not address GMP and GDP required for pharmaceutical excipients, adoption or acknowledgement of guidelines developed by associations such as IPEC would assist the establishment and maintenance of appropriate quality standards and therefore resilient excipient supply chains
- It is high time for a strong regulatory framework that compels pharmaceutical companies to disclose supply chain information regarding the origin of APIs as well as environmental and human rights risks involved in the manufacturing process
- The EU Good Manufacturing Practices (GMP) should also be strengthened to regulate the environmental release of pharmaceutical residues, including antibiotics and anti-infectives, from manufacturing plants throughout the supply chain. This would allow GMP inspectors to control manufacturing discharges from production.
- This has become particular challenge in the COVID-19 pandemic, when important drug suppliers like India and China were affected
- Not in the position to formulate an opinion or comment on the objectives defined under this strategic area related to the development and manufacturing of medicines, we welcome the general principles defined in this thematic area
- The scope of community pharmacy practice should be extended in supply challenges, including preparation of compounded formulations when alternatives are lacking. Shared electronic communication tools between pharmacists and prescribers) can enable this process effectively and safely.
- Building on the lessons learned from the sartan case, in particular regarding communication. The importance to communicate to HCPs before general communication is emphasised. Improvements could include giving more specific details to pharmacists and prescribers and boosting cooperation among communication teams and other stakeholders.
- The EMVS should be used to track and trace the essential medicines to prevent shortages

Cluster 3 (research):

- Regulatory authorities should analyse the implications of decentralized manufacturing technology developments, including on product characterization, control, quality assurance and manufacturers liability. The scientific advice with ATMP developers on these aspects should be enhanced.

Cluster 4 (public body):

- The need to establish new GMP/GDP regulations for veterinary medicines implies questions concerning the alignment of quality between the human and veterinary sector as many APIs are used by both sides. The FDA proposal for VICH to consider adopting a version of ICH Q7 Guideline on GMP for Active Pharmaceutical Ingredients should be supported by the EU. Setting comparable standards will maintain the option of rededication of medicines (as was done for propofol during the COVIS-19 pandemic).
- The need for extended supervisory oversight of supply chains (especially active substance manufacturing) should also take into account the manufacturing of the intermediates as well as the key starting materials
- Challenges which are not addressed are; Achieve EU's strategic autonomy and establishment of appropriate GMP rules for veterinary medicines, including for veterinary ATMPs
- Strong alignment with the new EFSA Strategy 2027 under development is needed
- Best use should be made of available resources such as international cooperation frameworks for assessments, inspections and testing on API supply chains
- Cooperation between assessors, inspectors and OMCLs is increasing. Any increased capacity building for inspectors should also be underpinned by adequately resourced and efficient OMCL support
- The document could further emphasise on the importance of up-to-date GDP rules and of an active GDP inspector network
- More responsibilities should be imposed on manufacturers and wholesalers

Cluster 5 (industry):

- With regards of enhanced transparency and traceability it should be noted that such information could be misused. It is crucial that such system takes place with the highest possible security where the purpose and content are carefully delimited, and that only authorities have access to such information.
- For medicinal gases a more appropriate specific strategy is required
- Welcomes the overall strategic goals outlined in this theme area – supply chain challenges, in particular reference to strengthening inspector training with respect to the implementation of the Delegated Regulation to the falsified medicines directive
- Global harmonized standards (and thresholds) would be welcome. Moreover, industry should be given sufficient time to respond to, and to implement, new requests and standards.
- A preferred way forward would be to provide incentives to move production to the EU – not mandate it to be – and to focus on essential medical products

- There is an urgent need to work towards the MRA between the EU-UK on GMP compliance, encompassing manufacturing facilities and plasma collection centres as well as acceptance of batch testing certificates for finished pharmaceutical product as well as plasma pools issued in the UK and EU
- The regulatory requirement to have all actors in the supply chain included in the dossier caused a huge regulatory burden. This has had a negative impact on the sustainability of medicines causing withdrawal from the market and a reduction of availability. This also reduces the number of suppliers. This requirement should instead be included in the companies' GMP system, introduction of SPOR/IDMP will facilitate and variations could be performed within the system.
- Regulatory flexibility should apply for all products impacted by a pandemic, and be considered beyond pandemics to have more efficient and modernized processes
- The consideration of the self-care aspects (products) of responses to pandemics could be addressed
- The importance of a robust supply chain has become revealed for a number of essential drugs during the SARS-COV2 pandemic
- Many of the challenges are well identified in the EU Network strategy while the proposed actions so far remain unclear or may not yet necessarily provide the optimal path to the required improvements
- The EMA SPOC and ISPOC are good initiatives by the agency to collect more information on supply problems caused by demand surges. In the future, the ISPOC should be further developed for longer term use
- With consolidated supply and demand information, the EMA and the Commission could provide guidance to industry to avoid shortages and ensure an equitable supply of medicines to all patients
- The objective to 'Analyse the possible implications of new manufacturing technologies' seems to not be directed towards a clear outcome in support of innovation
- Veterinary product manufacturing and marketing are much tighter in margins. The need for EU sourced material/manufacturing is difficult to maintain in a global playing field
- Regulatory measures are needed e.g. incentivising having and being able to easily maintain several sources of APIs in MA and enabling more rapid switching between API and finished product manufacturing sites to respond to supply demands
- It is unclear what is the gap in understanding of their responsibilities by the MAH that the Agencies perceive as currently existent. Further clarity is needed.
- The COVID-19 pandemic has reinforced this and demonstrated the public health value of a resilient and strong European generic, biosimilar and value-added medicines industry
- Regulatory oversight could be improved by reducing maintenance costs for older medicines (variations), giving a legal role for API producers to submit variations in the regulatory dossier (independent ASMF), conducting GMP inspections of foreign API and finished product (medicine) sites and using manufacturing site compliance metrics and risk assessment systems
- It will be crucial to bring significant critical API and finished dosage form manufacturing back to Europe to reduce dependence. Supportive measures will be needed. Regulators could support those measures by reducing the regulatory burden and by creating some financial incentives.

Europe should become the world leading manufacturing site for pharmaceuticals, from innovative to generic and biosimilar medicines. Initiatives should include investments in telematics, newer or greener or more efficient technology, and more.

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- The legal obligations of Directive 2001/83/EC, article 81 should be reinforced
- Applicants should also specify the sources of supply in their MAAs, indicating alternative solutions. Information on the robustness or weaknesses on the supply of medicines and shortages (including on individual products) should be transparent and publicly available.
- The differing resources and expertise of different Member States must be kept in mind as this area of the strategy is developed
- Storage conditions and stability studies are not adapted to a warmer world, requirements need to be revised
- Dependency on hydrocarbon for the manufacturing of most pharmaceuticals, the peak of hydrocarbon production was passed in 2008 and high tensions are expected around 2040-2050. Are we preparing for tomorrow's medicines production?
- Perhaps the EMA/ EMRN should favour IT / AI / big data infrastructures located in places that use renewable sources of energy or invest in renewable sources
- Understanding the patients' experiences of shortages and their impact on patients' health and quality of life will be important, as is patient organisations' involvement in continually communicating updated information on shortages, not only from regulators to the patient communities but also from the patient communities to the regulators. Appropriate channels and mechanisms should be set up for this.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Geographical risk analysis and the establishment of measures for the timely delivery of essential drugs in disaster situations is important
- The challenges presented focus on medicines and APIs whereas these same issues apply to what is generally the major component of any medicine, namely pharmaceutical excipients
- While this section addresses supply chain challenges from the perspective of quality and access to medicines, it does not consider environmental risks linked with pharmaceutical manufacturing. Outsourcing leads to the discharge of APIs into the environment during the manufacturing process, which has adverse effects on ecosystems and human health, and drives the development of antimicrobial resistance.
- Also, in the veterinary field, falsified medicines play a role or medicines sold illegally via the internet
- The concentration of medicines suppliers, in particular for generics should be addressed. This comment relates to human medicines.

Cluster 3 (research):

- The title of this Theme 5 "Supply Chain Challenges" is misleading as many of the underlying challenges are related to manufacturing and quality assurance. We recommend retitling the Theme as "Supply Chain, Production, and Product Quality".
- An alignment of regulatory requirements and practices across Member States for ATMP manufacturing, including for products manufactured under hospital exemption, could be fostered through the GMP Inspectors Working Group
- Need for a common approach on hospital exemption to ensure that it is used in a responsible, science-based, and harmonised way across Europe to protect patients' safety and interest
- The possible need to qualify centres for ATMP treatment and the possibility for patients to move cross-border for their ATMP treatment, as mentioned under the availability/accessibility strategic goal above, have an impact on supply chain management and could be considered in the strategy

Cluster 4 (public body):

- Need to strengthen Europe's ability to prevent, detect, assess, and respond to the threat of falsified medicines in order to protect public health. Given the widespread use of psychoactive medicines, one increasingly important area to address is the threat to human health from falsified psychoactive medicines
- The EU should strengthen the system for information about shortages (SPOC- and i-SPOC-System). All national competent authorities should be enforced to demand information about expected shortages of human and veterinary medicinal products from pharmaceutical industry.
- Introducing the principles of ICH Q12 for the veterinary sector should be considered
- To enhance traceability, oversight and security in the human /veterinary medicine supply chain a review of the Best Available Techniques Reference Document for Organic Fine Chemicals under the Industrial Emissions Directive is proposed. In this work as well as in the GMP guidelines emissions of pharmaceuticals to the environment, particularly to surface water should be considered.
- Stronger obligations on medicines producers, and other players in the supply chain is needed to ensure medicines are available
- A permanent platform should be created for the collection and sharing of data on stocks and potential shortages, shared between Member States and relevant stakeholders
- Increased cooperation among public authorities/national governments on shortages is needed
- Make sure that doctors receive information on available substitutes to medicines under shortage
- Empower national medicines agencies to monitor the implementation of Directive 2001/83 Articles 23a and 81 and impose sanctions on manufacturers should they fail to comply with the provisions of the relevant legislation

Cluster 5 (industry):

- There is a need for a refined definition of shortages, and this should exclude any consideration for stockpiling

- A distinction should be made between full-service healthcare distributors and other actors, distributing by choice only a selective range of mostly high margin products. GIRP therefore calls for a general revision of the wholesale distribution licensing system.
- The National Medicines Verification Systems (NMVS) could act as indicator of active wholesale distribution authorisations and distributors not connected should see their license revoked
- Mandatory minimum stocks, as proposed by some MSs, is not supported
- Regulatory provisions on a global scale need to be considered to lessen burden for all stakeholders involved (for example, through putting in place MRAs)
- Place an obligation on MAHs to pay the price difference between emergency or parallel imports and the normal reimbursement price for products in shortage in a given Member State. A so-called 'PSO-responsible-pay' principle.
- More legally bound responsibilities for the API manufacturers in the whole supply chain (longer term as some legislative changes might be required) is needed
- Transparency of supply chain logistics was mentioned in the Concept Paper but is not mentioned any more in the draft Network Strategy. Parallel traders, for example, should have greater accountability for reliability of supply.
- To ensure that the Goals and objectives of the EMRN strategy can be achieved, the engagement and consultation with industry needs to be greatly improved. A forum for exchange of dialogue could be established by the EMRN to include key stakeholders on CMC-GMDP manufacturing and supply topics.
- A European medicines supply committee could be established to incentivise more competition and manufacturing where supply is too consolidated
- An update is needed of GMP Annex 6 and EMA Guideline on Marketing Authorisations for Medicinal Gases
- Although the sustainability of the supply chain of radiopharmaceuticals has been addressed by several EU bodies, it is often studied only from an industrial point of view and not enough from a medical point of view
- The life cycle management of vaccines is particularly complex due to the number of post-approval changes (PACs) to be submitted worldwide. The objectives should include the support of EMRN for a revision of the EU variation regulation to streamline reporting of PACs. The EMRN should also include a plan to foster global regulatory convergence, in particular on PAC in its objectives.
- Many aspects of the manufacturing process in innovative biotechnology manufacturing are local, not international. This requires close proximity to patients and highly specialised manufacturing processes, as well as physicians and hospitals to administer care. If properly incentivised, EU manufacturing sites could be an attractive alternative for inclusion in global supply chain strategies.
- To facilitate EU manufacturing, the EMRN and Inspectorate need to prepare for manufacturing sites handling multiple types of biotechnology products. The current process of Type II variations for manufacturing of biologicals (including ATMPs) is considered restrictive and unattractive to manufacturers considering the EU.

- Manufacturing location in Europe of the API and/or medicinal product, particularly where chemical/synthetic active substances are concerned, can be a factor of increased security of supply and resilience
- More recognition of the public health value of a resilient and strong European generic, biosimilar and value-added medicines industry and the need to increase investments in this field
- On page 23 "may be manufactured outside the EU" - in fact several products travel more than once around the world (in whatever shape or form) before manufacture is completed
- Comment regarding "risk assessment evaluations...marketing authorisations," on page 25 - a role for HTA, regarding this may play a decisive role (e.g. HTAs declining their agreement to high-risk manufacturing chains)

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Individual members of the public, patient or consumer organisations and advocacy groups (N=xx)

- Member of EURORDIS's DITA Task Force. Greater collaboration (esp with EMA) in this area could yield benefits for all, albeit with some confidentiality issues to be resolved.
- IPOPI is participating through the Platform of Plasma Protein Users in many awareness raising campaigns focusing policy and decision maker. PLUS also organises yearly consensus conferences with the different stakeholders involved in blood medicine development to discuss and reflect on the issues the sector faces.

Healthcare professionals, veterinarians and their organisations (N=xx)

- Please also consult the CPME Policy on Medicine Shortages (https://bit.ly/3a5qGZZ).
- IPEC Europe in collaboration with other associations develops and continually revises good practices for the manufacture and distribution of pharmaceutical excipients.
- ESMO collaborated with The Economist Intelligence Unit (EIU) to produce six reports on medicines shortages. For more information: https://www.esmo.org/policy/shortages-of-inexpensive-essential-cancer-medicines
- The EIU, "Cancer Medicines Shortages in Europe – policy recommendations to prevent and manage shortages" provides six concrete policy recommendations to address and mitigate shortages of inexpensive, essential medicines at the EU Level.

Academic researchers, learned societies, European research infrastructures and other scientific organisations (N=xx)

- ARM recommendations on https://alliancerm.org/press-release/the-alliance-for-regenerative-medicine-outlines-recommendations-on-enabling-cross-border-and-regional-access-to-advanced-therapy-medicinal-products-atmps-in-europe/
  An updated position paper on the implementation of hospital exemption is also planned to be released in the coming weeks.

EU regulatory partners and institutions, health technology assessment bodies and payers (N=xx)

- The EMCDDA, in accordance with Regulation (EC) No 1920/2006* operates the European Union Early Warning System on New Psychoactive Substances that allows the European Union to rapidly detect, assess, and respond to public health threats caused by new psychoactive substances. This includes events related to authorised psychoactive medicines, and, in particular relevance to the draft EMA/HEA strategy, falsified psychoactive medicines. The EMCDDA and EMA already have a strong, active, working relationship, and will continue to exchange to support the EMA/HEA work in this area.
- EFSA is currently elaborating its 2027 Strategy, and more details on concrete initiatives will become available in the next months. We are looking forward to stronger collaboration on a number of your proposed objectives.
- ASTM is accredited by the American National Standards Institute (ANSI) and the Standard Council of Canada (SCC) and meets the World Trade Organization's (WTO) six principles for the development of international standards. ASTM and its subgroups are well positioned to support the ERMN.
- The EDQM CEP-inspection scheme supports and integrates with the activities of the Network. It is a well-established and well-known procedure on the assessment of quality data for APIs complemented by inspection of facilities for API manufacturing. In support of the EU Falsified Medicines Directive, timely information exchange and rapid alerts are crucial. EDQM has developed a database (KnowX) for reporting cases of falsified medical products and it includes a Rapid Alert function. It is ready to use and would not only allow timely warning, but also data collection and analysis.

Trade associations, individual companies and SMEs (N=xx)

- We are working with other supply chain stakeholders to increase knowledge sharing, and potentially build consensus on which monitoring systems should be enhanced/promoted to work in more MS.
- One of GIRP's main objectives is to support harmonised implementation of Good Distribution Practices with its members across Europe
- PPTA has been working on an advancement of the current MRA on GMP inspections to include U.S source plasma and U.S source plasma centers and PDMPs. PPTA also requested formally the UK and EU negotiators for a close alignment of the regulatory framework for plasma-derived therapies between the EU and the UK to be considered specifically requesting urgent recognition of the importance of establishing an MRA on GMP compliance between the EU and the UK.
- EFPIA white paper: "White paper on manufacturing and upscaling submitted to EMA for discussion in the context of COVID-19". Recommends that the consultation processes/engagement with industry, as a key stakeholder for Theme 5, be greatly increased to ensure that the objectives of the EUNS 2025 can be realised. Recommends that an effective forum for regular and/or continuous scientific dialogue with key stakeholders on CMC-GMDP manufacturing and supply topics.
- EUCOPE members; Identify the specific root causes of real shortages and develop strategies to improve prevention and management of shortages. ;Help to identify and suggest areas where changes to EU or national legislation could improve supply (such as legal obligations of MAHs to maintain EU stock levels and receive respective information from other actors in the supply chain.; Develop better scientific evidence which serves different decision-makers along the decision chain and supporting post-licensing variations

Strategic focus area: Sustainability of the Network and operational excellence

Question 6: Do the objectives adequately address the challenges ahead?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Offer online training
- Include concrete action for monitoring strategy implementation with regular reviews (including public representation) of progress towards goals
- Resume publication of clinical data
- Enhance provision of information in lay language
- Provide concrete information on how Network plans to meaningfully interact with stakeholders and civil society
- Reduce dependency on industry fees by increasing resources from the EU budget
- Establish an EU Ethics Committee
- Expand remit to address economic aspects of medicines
- Further interoperability in decision making with HTA bodies and other stakeholders
- Developing better policies, mechanisms and channels for engagement with patients, healthcare professionals and the public

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

- Further develop pharmacovigilance system
- Develop an equivalent system to the FDA's Inactive Ingredients Database
- Recognise and invest in not-fee based activities
- Establish a continuous improvement programme

Cluster 3 (research):

- Making dossier / pivotal study data available for scrutiny & re-analysis by independent groups

Cluster 4 (public body):

- In the section "Strategic Goals" there is no explicit reference to the veterinary medicines regulation / veterinary sector
- A future option could be that pharmaceutical companies submit only one joint environmental data set per active substance, which are available in one central database
- It is proposed to initiate a systematic programme for filling the data gap for existing substances without ERA data

- Coherent data for the active substances could be used for authorisation procedures of medicinal products as well as for the derivation of environmental quality standards under the Water Framework Directive etc.
- Ensure public or, at least, easy on-demand access to full clinical study reports

Cluster 5 (industry):

- Transparency is a need not only to justify EMA outputs, but to support downstream decision-making at price-reimbursement levels. In particular, the specific contents of European Public Assessment Report, including secondary outcomes, pre-specified subgroup or multi-variant analyses, etc., could be standardized.
- Increasing number of authorised ATMPs will require further development/adaptation of OMCL resources to ensure regulatory capability to perform independent product testing if requested
- The need to align the criteria between regulators and HTA is of the utmost interest, and the difficulties to provide single EU opinions for Access should be accepted and recognised. Any action should be done in an independent way that ensures lack of industry interests distorting decisions, which should be based purely on public health interests.
- Learnings from covid-19 should be taken into consideration when revising guidance for flexible activities in conduct of clinical trials and manufacturing / supply chain to secure the public safety and accessibility of medicines
- Harmonized guidance, to which member states are committed to, are needed so that there are no national interpretations/exceptions
- Commitment to the data-driven environment is expected
- The strategy does not clearly describe what the actions are to overcome the hurdles of: funding, commitment by all the NCAs. There is no tangible framework to bring this forward (an agreed and supported pan-network programme plan to implement SPOR/IDMP with TOM)
- Implementing and utilising reliable master data is needed as a foundation to a digital strategy
- The should be a strong commitment for SPOR and TOM. Also for proper implementation of ePI. The individual NCAs should be "forced" to implement, to avoid issues like experienced with eCTD.
- With the implementation of SPOR/IDMP/TOM, the regulatory system can be completely revised to make this much more data driven instead of document driven. A lot of efficiency can be gained
- A balance between EC funding for public health and funding from medicines developers for fee-for-service activities is needed to deliver a world-class regulatory system in the interest of patients - efficiency improvements instituted to simplify the fee system would have a substantial positive resource effect on EMA and NCAs
- Stress the need for vaccine specific expertise within the Network, especially to address the new technologies being used in vaccine development and manufacturing, as well as public health issues such as vaccine hesitance
- Important to have appropriate resources to implement rapid and agile enabling IT Systems and reduce burdensome and repetitive processing tasks across the EURN and by industry
- It will remain to be seen how to receive timely and consistent advice from the diverse EU network (EMA, CTFG, NCA). For instance, a staggered approach to ask for advice first from e.g.

NCA then SNSA or EMA, or first EMA than CTFG, NCA might add value for some concepts, however, would add additional time to get feedback on development and clinical trial questions.

- An area that would benefit from operational excellence upfront is the new IVD regulation.
- Operational integration of a new stakeholder in the network (Notified Bodies) is crucial. Similarly, enhanced uptake of CDx in HTA processes is critical.
- One of the main objectives of the New Veterinary Regulation is the reduction of unnecessary burden, both for regulators and industry. It should by all means be avoided that this is not a lost opportunity and a missed chance for better/efficient regulation. The strategy should point at this as a core element for veterinary medicines.
- Objectives relating to the continuation of IT projects and EMRN's contribution to the discussion on the review of fees are important for the network to deliver. However, we feel these specific actions should be considered business as usual rather than having specific attention drawn to them through the EMRN Strategy.
- Active stakeholder engagement is crucial to ensure maximum outcomes are reached for the benefit of the EU healthcare sector and, ultimately, patients
- The HMA/EMA Regulatory Optimisation Group is the primary platform to develop Network thinking on reduction of regulatory burden. It is on hold for the moment and we call for its urgent restart of activities and that the deliverables become guidance/best practices to be taken into account by the network.
- The importance of the interoperability of IT services and of the IT integrated systems to support further optimisation and operational excellence if the Regulatory Network shall be the Priority Number ONE, including necessary and adequate funding
- Although it is mentioned that the network should address the reduction of regulatory burden for both regulatory authorities and for our stakeholders whilst meeting stakeholders' expectations with regard to off-patent medicines, it is not very clear what the Network's direction and vision are regarding the final outcome

Question 7: Are there any other challenges that should be addressed by the EMA/HMA network in this area?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

- Enhance provision of information in lay language
- 'Uncomfortable' patient questions can lead to fresh insights and even breakthroughs

  Make use of network of patient organisations and advocates to develop and share best practice on meaningful patient involvement in different areas of pharmaceutical regulation

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

No comments were received from the healthcare professionals.

Cluster 3 (research):

No comments were received from the research stakeholders.

Cluster 4 (public body):

- Vaccine-specific shortage management is a challenge
- We developed the basic idea on 'environmental monographs' on active pharmaceutical substances. The aim of such a 'monograph system' is first of all to generate a comprehensive set of valid physico-chemical data, fate and effects data. Once established all applications for marketing authorisation of a medicinal product could use the agreed information from the 'monograph' of the respective active substance to perform the ERA of the medicinal product.
- EDQM work on the classification of medicines, issuing recommendations on harmonized classification of medicines (POM, OTC) could serve in the IDMP project. In any case, these initiatives should be aligned and coordinated as much as possible.

Cluster 5 (industry):

- Since we believe that delivery of the EMA's Regulatory Science Strategy to 2025 is critical, once the two strategies are integrated, there should be a further discussion with stakeholders on the relative priorities of all the identified goals, objectives and actions
- The EU Telematics Strategy should be a fully integrated part of the EU Network Strategy
- The sustainability of the network to support the Self-care industry should be included in strategy
- ROG contribution via association, IDMP working groups via associations are a challenge
- Implementing and utilising reliable master data is needed as a foundation to a digital strategy
- The recent pandemic shows the need for harmonized implementation in all EU countries of CESP
- The need for paper copies and wet signatures could temporarily be waived in some markets during the first waive of the Covid-19 crises, however, all EU markets should accept all documents to be submitted electronically, using electronic secured signatures
- An underlying factor when addressing the sustainability of the EMA and ERMN is the ever-increasing reliance on digital infrastructure and integrated IT systems – highly critical for a modern operation of the overall regulatory system. However, within the EUNS 2025, this foundational telematics element is somewhat diluted because references are spread across the different themes.
- A comprehensive EU Telematics Strategy must be fully integrated into the EUNS 2025 and appropriately prioritised and resourced. EFPIA considers that one of the issues that needs to be reconciled is that at the EMA level, IT funding comes from the EU, whereas at the MS NCA level, the IT funding comes from the national governments.
- The learnings from COVID-19 show that virtual meetings are likely to replace many face-to-face meetings in the future. To ensure efficient virtual meetings, appropriate communication systems that include the possibility of videoconference and of sharing presentations are needed.
- The possibility to receive good quality advice from EMA on medicine's development is very important and several options already exist to obtain feedback from the Agency. However, the industry would welcome a more streamlined/integrated approach to regulatory consultations rather than receiving separate advice from different EMA committees (e.g. CHMP, PDCO, etc).

Alignment between NCAs positions should also be improved to facilitate vaccine development and life cycle management in the EU

- Learnings from covid-19 is a challenge missing
- Our current perception is that different members of the network are operating at different levels of digital preparedness. For the EMRN to be successful in its digital ambitions, it is vital that all members of the network have the capability, expertise and infrastructure to be able to fully contribute
- A transparent and cooperative process to determine the work needed should include stakeholders from industry. This will secure broad alignment on the actual needs and effective use of the allocated resources.
- Ensuring on-going access to medicines is critical during COVID-19 pandemic. In this emergency, regulators displayed flexibility and made risk-based decisions, adjusting some established regulatory practices to help ensure continuity of product availability. This approach to the granting of MAs and maintaining access to quality, safe and effective medicinal products should be encouraged outside of a pandemic situation to address eg potential supply chain disruption.
- The Network should discuss further with industry how to optimally organise the available expertise within the Network to ensure timely access to advice
- The network may also want to discuss the industry view of IT operating models and digital business transformation to facilitate a more joined-up approach and to avoid having incompatible systems
- We strongly support any efforts to further standardize submission and collection of information for comprehensive evaluation in terms of clinical trials, authorisation procedures, pharmacovigilance, GMP etc. because this will avoid duplication of effort by creating a single source of reliable data to support regulatory knowledge and decision making
- Much progress has been made by the applicable CMDh subgroups towards harmonising and reducing National requirements related to provision administrative documents; such work should be further encouraged towards the total removal of differentiated national requirements
- Developing Good Reliance Practices (GRP) among EU/EEA regulators could also be useful for avoiding duplication of work and streamlining resources of regulatory bodies and industry

Question 8: Are you undertaking concrete actions in this field that could support or complement EMA/HMA network activities?

Cluster 1 (individual member of the public, patient or consumer organisations and advocacy groups):

No comments were received from the healthcare professionals.

Cluster 2 (healthcare professionals – both within the human and veterinary domain):

No comments were received from the healthcare professionals.

Cluster 3 (Research)

- The Network on Veterinary Medicines is relatively new among the already existing EUFEPS Networks. Its creation was prompted by the straight ambition of EUFEPS to bring together pharmaceutical societies as well as academic, industrial, and regulatory scientists engaged in drug research and development, drug regulation, and education of professionals. The focus of the Network is on the manifold issues specifically linked to veterinary medicines and on the inherent interconnection with human medicine, environmental and public health.

Cluster 4 (public body):

No comments were received from the healthcare professionals.

Cluster 5 (industry):

- We are updating our systems to be prepared for SPOR/IDMP, following guidance's coming out. Are contributing to the SPOR taskforce.

- We are actively involved in the inter-association taskforce on ePI and join the discussions with the pioneers group."

- Goal 1/Objective 1: Integrate EMA's Regulatory Science Strategy to 2025 within the EMRN 2025 Strategy

- Goal 1/Objective 2: Ensure 'fit-for-purpose' scientific capability of the Network

- Goal 2/Objective 1: Optimise the current regulatory framework by ensuring efficiency of the existing regulatory operations

- Goal 3/Objective 2: Ensure best use of resources through promoting mutual reliance and work-sharing

- Goal 4/Objective 1: Establish an IT operating model and services, in support of the digital strategy and digital business transformation

- Goal 5/Objective 1: Review learnings from COVID19 and strengthen EU coordination and response to public health emergencies, including crisis communication

- Goal 1/Objective 3: Ensure optimal organisation of the available expertise within the Network

- Goal 2/Objective 3: Continue already initiated IT process improvements to further professionalise securing, provisioning and running of technology services

- Goal 3/Objective 1: Contribute to the revision of the current fee regulation, and implement the final solution

- Goal 3/Objective 3: Continuously seek effectiveness and efficiency gains to maximise use of scarce resources"

- Vaccines Europe has developed a document listing the main bottlenecks to the rapid development and authorisation of COVID-19 vaccines. Challenges and proposals highlighted in this document should be taken into account by EMRN.

- The Accumulus group is working to build a future digital regulatory ecosystem using cloud-based platforms to facilitate the exchange of data. Sponsor data would be stored within a company/shared/third party-controlled data housing platform. The regulatory authority would receive data access at the time of submission. This cloud-based approach also allows input from other data sources to guide regulatory decision making and facilitates real time data review. Accumulus aims to stand up a new not for profit organisation and has been proceeding to have discussions with regulators on piloting use cases.

Annex II: Glossary

3Rs	Principles relating to the use of animals in medicines testing (Refine testing to reduce the harm to the animal, Reduce the numbers of animals required, Replace animal testing wherever and whenever it is possible)
AI	Artificial intelligence
AMR	Antimicrobial resistance
AMU	Antimicrobial use
API	Active pharmaceutical ingredient
Article 57 database	Database of authorised human medicinal products in the EU, maintained by EMA. Marketing authorisation holders are required to submit information on their medicines to the Article 57 database in accordance with Article 57(2) of Regulation (EC) No. 726/2004
ATMP	Advanced therapy medicinal product
BARDA	Biomedical Advanced Research and Development Authority, an office within the US Department of Health & Human Services established to aid in responding to chemical, biological, radiological, and nuclear threats, including emerging infectious diseases
Big Data	extremely large datasets which may be complex, multi-dimensional, unstructured and heterogeneous, which are accumulating rapidly and which may be analysed computationally to reveal patterns, trends, and associations. In general, big data sets require advanced or specialised methods to provide an answer within reliable constraints
CHMP	EMA's Committee for Medicinal Products for Human Use
CMA	Conditional marketing authorisation
Co-selection	Selection of genes for resistance to an antibiotic by exposure to another substance (e.g. a different antibiotic, a heavy metal, feed additive or biocide) because the gene for resistance to the second substance is on the same shared plasmid
COVID-19	A novel coronavirus infection, first noted to affect humans in China in 2019
CTIS	Clinical Trial Information System
CVMP	EMA's Committee for Medicinal Products for Veterinary Use
DARWIN	Data Analysis and Real World Interrogation Network, a proposed EU platform to access and analyse healthcare data from across the European Union
Digital Single Market	A strategy of the European Commission to ensure the best possible access to the online world for individuals and businesses

EC	European Commission
ECDC	The European Centre for Disease Prevention and Control
EEA	The European Economic Area, comprising the EU Member States, Iceland, Liechtenstein and Norway
EFSA	European Food Safety Authority
EMA	European Medicines Agency
EMRN	European Medicines Regulatory Network, the Network
EMVS	The European Medicines Verification System, a system for tackling falsified medicines by supplying unique identifiers that allow verification at all stages of distribution and use
ENCePP	European Network of Centres for Pharmacoepidemiology and Pharmacovigilance
ePI	Electronic product information
ERA	Environmental risk assessment
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption, a project which collects information on how antimicrobial medicines are used in animals across the European Union (EU)
EU	European Union
EUCAST	European Committee on Antimicrobial Susceptibility Testing, an EU Committee to harmonize antimicrobial breakpoints
EudraGDMP	An EU database of GMP and GDP information
EU-Innovation Network, EU-IN	A collaboration between the EU NCAs and EMA, aimed at fostering medicine innovation and early development of new medicines
EUnetHTA	European Network for Health Technology Assessment, a collaboration between HTA bodies across Europe.
EU-NTC	EU Network Training Centre, a centralised resource for training and sharing best practice in the EMRN
EU-PAS	The European Union electronic Register of Post-Authorisation Studies, a publicly available register of non-interventional post-authorisation studies maintained by EMA and hosted by ENCePP
FAIR	Guiding principles for data management and stewardship, that data should be Findable, Accessible, Interoperable and Reusable
FAO	UN Food and Agriculture Organisation
FP	Finished product
GDP	Good distribution practice
GDPR	General Data Protection Regulation
GMO	Genetically modified organism

GMP	Good manufacturing practice
HMA	Heads of Medicines Agencies, a strategic and coordinating body representing the national medicines regulators of the EEA countries
Horizon Europe	The EU's proposed future research and innovation programme
Horizon scanning	Systematic examination of information to identify potential threats, risks, emerging issues and opportunities
HS	Horizon scanning
HTA	Health Technology Assessment (body)
ICH	International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use
ICMRA	International Coalition of Medicines Regulatory Authorities
IDMP	Identification of Medicinal Products, a suite of standards developed by ISO
IMI	Innovative Medicines Initiative, a public-private partnership funding health research and innovation in the EU
IRIS	EMA's online Regulatory and Scientific Information Management Platform
ISO	International Organization for Standardization
ITIL	Information Technology Infrastructure Library, a set of practices for IT service management that focuses on aligning IT services with the needs of business
ITF	Innovation Task Force (EMA)
JIACRA	Joint Inter-agency Antimicrobial Consumption and Resistance Analyses, joint reports of EMA, EFSA and ECDC that analyse data from humans and food-producing animals to better understand the occurrence of antimicrobial resistance across Europe
MAH	Marketing authorisation holder
MDR-TB	Multidrug-resistant tuberculosis, resistant to at least both isoniazid and rifampicin
MERS	Middle-Eastern Respiratory Syndrome, a coronavirus infection
MNAT	Multinational assessment team, a worksharing arrangement in which experts from several EU/EEA countries contribute to a medicine's assessment
MSs	Member States
MRA	Mutual recognition agreement
NCA	National competent authority, one of the national medicines regulators that form part of the Network
NITAG	National Immunization Technical Advisory Group

OECD	Organisation for Economic Co-operation and Development
OIE	World Organisation for Animal Health
One Health	an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.
P&R	Pricing and reimbursement
payers	Authorities responsible for P&R decisions at national level
PCWP/HCPWP	EMA's Patients and Consumers Working Party and Health Care Professionals Working Party
Pharma 4.0	Use of data analytics to optimise use of resources (people, physical systems, and data) in the pharmaceutical industry
PIC/S	Pharmaceutical Inspection Co-operation Scheme, an informal co-operative arrangement for regulators on Good Manufacturing Practice (GMP) of human and veterinary medicines.
PK/PD	Pharmacokinetics and pharmacodynamics
Platform technology	a structure or technology from which various products can emerge without introducing a new process, through recombining different components or functions in various ways
PLEG	Post-launch (post-licensing) evidence generation
POC	Point-of-care (diagnostics)
Post-licensing evidence	Evidence on the efficacy and safety of a medicine produced after regulatory approval and marketing
Precision medicine	An approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle in selecting treatments
PRIME	Priority Medicines Scheme (EMA)
PSI	Public Sector Information (Directive)
Regulatory science	the range of scientific disciplines that are applied to the quality, safety and efficacy assessment of medicinal products and that inform regulatory decision-making throughout the lifecycle of a medicine
RWD	Real-world data
SAFe	Scaled Agile Framework, a set of workflow patterns and organisational principles for software development
SARS	Severe Acute Respiratory Syndrome, a coronavirus infection
SAWP	The Scientific Advice Working Party of EMA's CHMP
SDG	Sustainable Development Goal

SmPC	Summary of Product Characteristics, approved EU product information for healthcare professionals
SNSA	Simultaneous National Scientific Advice (pilot project of the EU Innovation Network)
SPOR	Substance, Product, Organisation and Referential master data, areas of standardised nomenclature to identify medicinal products, as developed by the ISO
STAMP	Expert Group on Safe and Timely Access to Medicines for Patients, a group providing the European Commission with advice and expertise on the implementation of EU pharmaceutical legislation, programmes and policies
STARS	Strengthening Training of Academia in Regulatory Sciences, a project of the European Commission
TATFAR	Transatlantic Task Force on Antimicrobial Resistance
Telematics	The branch of information technology which deals with the long-distance transmission of computerised information
TF	Task force
TISP	Topic Identification, Selection and Prioritisation, part of a collaborative horizon scanning project between EUNetHTA and EMA
TFAMR	Task Force on Antimicrobial Resistance of the Codex Alimentarius
UPD	Union Product Database, a database of information on all authorised veterinary medicines and their availability in EU Member States, mandated by the Veterinary Regulation, Regulation (EU) 2019/6
VETCAST	EUCAST Veterinary Subcommittee
VICH	the International Cooperation on Harmonisation of Technical Requirements for Registration of Veterinary Medicinal Products, a trilateral (EU-Japan-USA) programme aimed at harmonising technical requirements for veterinary product registration
WHO	World Health Organization
XDR-TB	Extensively drug-resistant tuberculosis, resistant to several lines of treatment as well as isoniazid and rifampicin