

REPORT OF SURVEY ON ASSESSMENT OF THE CURRENT LEVELS OF SERVICE DELIVERY OF NMHSs BASED ON THE GOALS OF “THE WMO STRATEGY FOR SERVICE DELIVERY”

This survey was designed to enable individual NMHSs determine their level of service delivery and which areas needed to be improved upon in order for them to progress to higher levels.

**REPORT OF SURVEY ON ASSESSMENT OF THE CURRENT LEVELS OF SERVICE
DELIVERY OF NMHSs BASED ON THE GOALS OF “THE WMO STRATEGY FOR
SERVICE DELIVERY”**

Acknowledgement

Survey development by: Elliott Jacks, Chairperson (ET/DPM), Office of Climate, Water and Weather Services, National Oceanic and Atmospheric Administration

Survey analysis compiling of the report: Ms Haleh Kootval and Mr Samuel Muchemi

REPORT OF SURVEY ON ASSESSMENT OF THE CURRENT LEVELS OF SERVICE DELIVERY OF NMHSs BASED ON THE GOALS OF “THE WMO STRATEGY FOR SERVICE DELIVERY”

BACKGROUND

This is a survey report on assessment of the current levels of service delivery of National Meteorological and Hydrological Services (NMHSs) based on the goals of “The WMO Strategy for Service Delivery”¹ hereinafter referred to as “The Strategy”. The survey was designed to enable individual NMHSs determine their level of service delivery and which areas needed to be improved upon in order for them to progress to the next level as defined in the survey, or to an even higher level of service delivery.

The survey was also designed to provide the WMO Public Weather Services (PWS) programme with information that would enable it prioritize training and other activities aimed at effectively assisting NMHSs progress the quality of their service delivery to users. Responses to the questions were mostly in the multiple choice form, although the questionnaire also included room for written responses which provided additional details where desired.

¹ “The WMO Strategy for Service Delivery” can be accessed through:
http://library.wmo.int/opac/index.php?lvl=notice_display&id=16002#.VEkPxfmUePY

1. PARTICIPATION OF NMHSs

There were 85 out of 191 respondent NMHSs to the survey which represented a 45% return. (The list of countries that responded to the survey is attached to this report as Annex 1). The survey questionnaire was provided in Arabic, English, French, Russian and Spanish through an internet online platform. In some cases, NMHSs responded to some questions of the questionnaire leaving some unanswered. For this reason, care was taken to consider the number of NMHSs that responded to each question in order to ensure accurate calculation of percentages.

2. PRESENTATION OF THE SURVEY RESULTS

The online survey platform used for this exercise provided analysis of all the multiple choice and written questions for each of the languages of the survey. However, since the survey was issued in several languages, individual language analyses provided automatically by the survey platform could not be used directly. Hence, in processing the report, for each multiple choice question, the responses in different languages were collated and put on an Excel file from which new graphs were generated. The graphs in this report therefore represent the complete picture of the survey responses in all languages.

In order to ensure benefit to NMHSs, recommendations have been provided with a view to assisting them progress to the next or to an even higher level of service delivery. It should be noted that, these recommendations indicate the least action that a Meteorological or Hydrological Service (NMS) could take, but in no way restricts them from taking more substantive steps to propel them higher by two or more levels of service delivery. Where available, references to enable NMHSs access guidance, tools and examples have been provided.

Analyzed responses to the survey questionnaire may be accessed online by clicking [here](#)².

3. STRATEGY ELEMENT 1: PROGRESS WITH EVALUATING USER NEEDS AND DECISIONS

Q2: What processes do you have in place for determining who uses your products?

- a. There are no processes in place for engaging with users and we don't know who they are.
- b. We know of some of our users, but we have not formally documented who they are and how often we engage with them.
- c. We have a Memorandum of Understanding (MOU), Customer Supplier Agreement (CSA) or Service Level Agreement (SLA) in place with some users, but it is not kept up to date. We have occasional meetings with our users, but contact is not regular.
- d. Same as c., except we do have regular meetings with our users.

² <http://www.wmo.int/pages/prog/amp/pwsp/surveys.htm>

- e. An MOU, CSA or SLA is in place for each user. It is regularly reviewed and updated, and new products and services emerge from regular user interactions.



Fig. 1: Levels of establishment of processes in NMHSs for determining who uses their products

Responses

75 NMHSs responded to this question. Regarding the processes that NMHSs use to determine who uses their products, the majority of respondents (32%) are at level (c), indicating that they have tools such as a Memorandum of Understanding (MOU), Customer Supplier Agreement (CSA) or Service Level Agreement (SLA) in place with some users, but the tools are not kept up to date. They also have occasional meetings with their users, but contact is not regular. However, 6.7% are at level (a) meaning that they do not have processes in place for engaging with users, neither do they know who the users are; and about 18.7% of respondent NMHSs know of some users, but have not formally documented who they are and how often they engage with them.

Recommendations

1. NMHSs at levels (a) above, may consider initiating the process of user engagement as a necessary step toward ensuring effective service delivery. [Extract 1](#) of The Strategy provides an introduction on how to engage users and the possible related activities for NMHSs.
2. In order for NMHSs at level (b) to progress to the next level of service delivery, they may consider instituting the use of a memorandum of Understanding (MOU), Customer Supplier Agreement (CSA) and Service level Agreement (SLA) with users. User engagement is well explained in the WMO guidelines (WMO No. 1099, PWS-26). Sample templates of an MOU, CSA and SLA are also provided in “The Strategy” as follows: MoU: pages, 69-73; CSA: pages, 74-85; and SLA, page 86.

Q3 How do your users contact you?

- a. We have no mechanism for contacting users.
- b. We established a contact protocol, but it is unreliable due to either technical issues (internet unreliability) or lack of commitment on either side to maintain contact.
- c. Contact protocols have been established and are reliable, and are used from time to time.
- d. Contact is regularly scheduled and ad hoc contact is encouraged according to need.
- e. Our NMHS has established dedicated teams or individual(s) for the purpose of ensuring that contact is maintained and mutually beneficial.

Responses

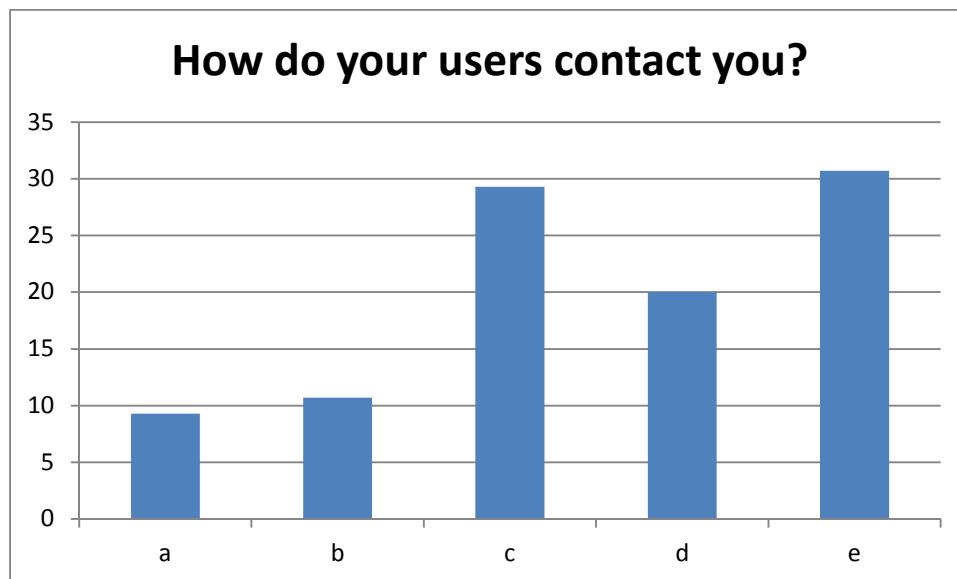


Fig 2: Showing in percentages, how users contact NMHSs

75 NMHSs responded to this question. In terms of establishment of mechanisms for users to contact NMHSs, most of the respondent NMHSs, about 30.7% have established such mechanisms hence they are at level (e). However, there are NMHSs in levels (a) about 9.3%, and (b) about 10.7%, which need to either establish the mechanisms or to improve them because they are not fully functional. A large percentage of the NMHSs, 29.3%, are at level (c) meaning that development in this area is in progress.

Recommendation

1. NMHSs at level (a), could consider initiating a mechanism for identifying users. This could, for example, involve forming a team or initiating a unit whose duties would be, or would include, identifying users of the services provided by the NMHS, and establishing protocols of how a two-way-communication could be ensured. This is particularly important while dealing with specialized uses such

as the media and the disaster community. For the general public, contact information could be provided on the Website.

2. NMHSs at level (b) could consider a sensitization initiative to build commitment of the staff of the meteorological service as well as key users in maintaining robust communication. They could also consider investing in a dependable communication system such as internet as this is essential to ensuring communication with users through platforms such social media.

Q4 How do you collect and document user requirements to facilitate the development of products and services?

- a. We do not gather or document user requirements for NHMS products or services.
- b. We informally understand some user requirements, but they are not clearly articulated in any significant detail.
- c. We have outlined the requirements of our users, but this documentation still lacks detail required to develop usable products and services.
- d. We have worked together with our users to document their needs, but we do not have a process in place to regularly update them.
- e. We have a well-documented, established means for collecting user requirements.

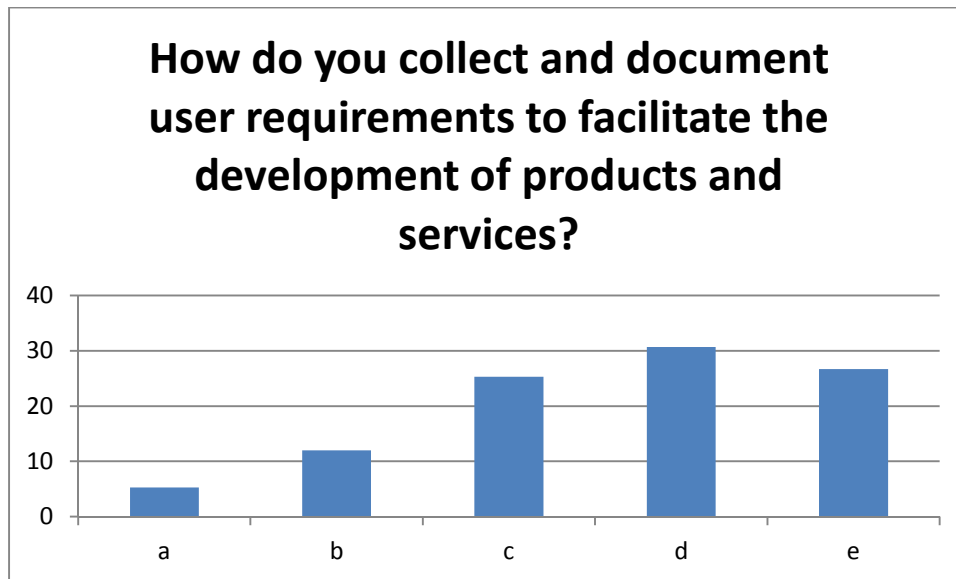


Fig 3: Showing in percentage, the levels to which NMHSs collect and document user requirements

Responses

Most NMHSs (30.7%) are at levels (d). This means that the NMHSs are at an advanced stage of development in collecting and documenting user requirements, and have worked together with their respective users to document their needs although they do not regularly update them; 26.7% of the NMHSs are at the advanced level (e). On the other hand, about 5.3% of the respondent NMHSs do not gather or document user requirements, placing them at level (a). The remaining NMHSs are at levels (b) and (c).

Recommendations

1. For the NMHSs at level (a) and (b), it would be advisable to devise a way of collecting feedback from users and keeping a record of such feedback. For example they could consider using the Feedback log. This is a document used to record feedback from the user or customer on the products and services provided. This document should also be used to help determine any action taken in response to the feedback (SSD, pp 87-88).
2. Regarding getting feedback from the public, different channels such as regular surveys, web feedback and social media could be used for gathering information, their level of satisfaction with the services, and areas where action is needed to improve service delivery. The following summary guidelines publication titled "Using Surveys to evaluate Services (PWS-SG 4)" provides useful information of how a Meteorological service could use surveys effectively.

Q5 How can WMO support you in improving or developing processes to ensure you build stronger and more productive relationships with those who rely on information and services provided by your NMHS? For example, would it be helpful if WMO referred you to examples of how other NMHSs successfully evaluate user needs and decisions? (Please write your answer in the text box below).

Responses

Over 90% of the respondents requested for the sharing of best examples of how other NMHSs successfully evaluate user needs and decisions. Other suggestions included the following:

1. Examples of best practices, template documents (for MOU, SLA etc) and training in user engagement;
2. Support in training and working attachments in other NMHSs for staff of NMHSs;
3. Sharing of methodologies;
4. Development by WMO of e-learning training modules at sub regional and regional levels;
5. WMO could send experts to NMHSs to provide assistance with the actual implementation of the Strategy for Service Delivery;
6. WMO could provide NMHSs with some innovative and practical tools (e.g. software applications);
7. WMO could enable NMHSs to share examples of customer service standards, information about global and regional trends in customer requirements and technological developments. This information would help NMHSs in their in-house monitoring processes; and
8. It would be helpful for WMO to provide an overview of primary mechanisms that various NMHS use to gather user requirements and the ones they consider the most successful.

4. STRATEGY ELEMENT 2: LINK SERVICE DEVELOPMENT AND DELIVERY TO USER NEEDS

Q6 What documentation do you maintain to define the products and services you deliver?

- a. We do not have any documentation related to products or services.
- b. We have documentation for a small number of products or services, but it is not regularly updated.
- c. We have some of our key services documented via an instruction or SLA and we routinely update this documentation.
- d. We have documented information for most of our products and services via internal instructions, or an SLA, and we routinely update this information.
- e. Same as d., except documentation exists for all of our products and services.

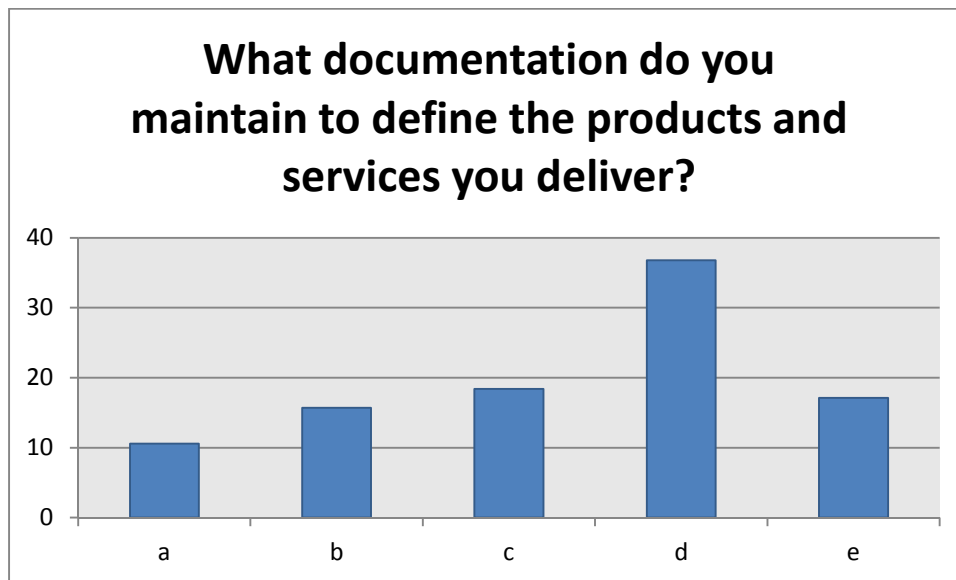


Fig 4: Showing percentage of NMHSs in each category of documentation of products and services they deliver

Responses

There were 75 respondents to this question. The majority of respondents (37%) indicated that they document information for most of their products and services via internal instructions, or an SLA, and routinely update this information. 15% keep records for all their products updated; level (e). However, about 10% of the respondents are at level (a), without any documentation related to products or services while about 15% have documentation for a small number of products or services, which is not regularly updated.

Recommendation

Documenting information for products and services is important as it enables users to know what services the provider is capable of providing, that may be useful to the user.

1. NMHSs at level (a) may wish to introduce and keep updated a mechanism for documenting information about products and services they provide. Below are examples:
 - i. Product catalogue: A document used to log the products (and services) provided to users and which serves as a reference for other related documents, such as a CSA. The product catalogue ensures visibility of the total portfolio of products and services provided (See WMO SSD, page 91).
 - ii. Work instruction template: A document used to describe in detail how an individual product is produced, the templates for the product and the inputs/information used to generate the product in order to ensure consistency of output. Any targets such as delivery times should also be included. (See WMO SSD, pages 92-93)
2. NMHSs at level (b) could take measures to ensure a regular updating of key services that the NMHSs may have documented. This could require a combination of sensitization and training of staff, as well as ensuring that the task of regular updating is assigned to a particular office and progress is monitored, administratively.
3. NMHSs at level (c) would need to ensure that they document as many products as possible and keep the record updated

Q7 How do you inform users when your products or services change?

- a. We do not have any mechanism for informing users of product or service changes.
- b. We inform some users of service changes, but only on an ad hoc basis.
- c. All users are informed when our products and services change.
- d. We have a formal process for service change to ensure users are prepared (e.g., can make needed software changes) before the new products and/or services are issued.
- e. Users are directly involved in identifying the new product and service requirements, so they provide feedback on technological and policy based needs in advance of the change.

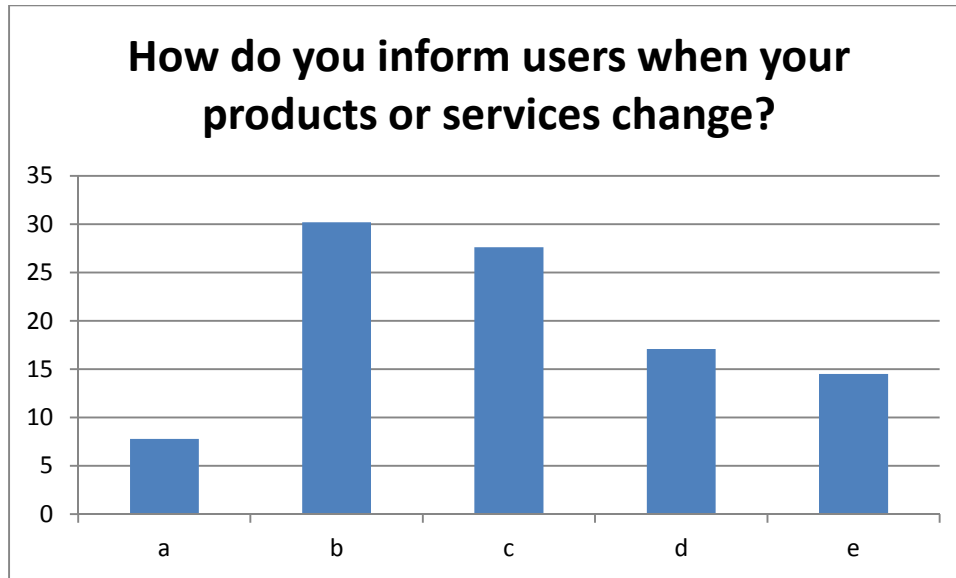


Fig 5: Showing how NMHSs (in percentages) inform users when their products or services change

75 NMHSs responded to this question. The majority of the respondents (30%) inform some users of service changes, but only on an ad hoc basis; i.e. level (b). About 28% of respondents inform all users but there is no formal process for informing users; level (c). 8% of the respondents do not inform their users when they change products; category (a).

Recommendations

1. NMHSs at level (a) may initiate a mechanism for informing users as a way of progressing to a higher level of service delivery in this respect. The mechanism could involve taking stock of current services using the product catalogue (see question no. 6) above, sharing the information with users and agreeing with them on how future changes to the products would be reported.
2. NMHSs at levels (b), (c) and (d) could consider including more products and more users to whom they communicate change. They could also invite users to participate in identifying product and service requirements through feedback on technological and policy based needs. These measures would assist NMHSs advance to the respective higher levels of service delivery in this area.

Q8 How do you integrate user needs into service development and delivery?

- a. Development of services is not based on user requirements.
- b. User requirements are sometimes taken into account for development of services, but on an ad hoc basis.
- c. We have a documented process for integrating user requirements, but they are applied inconsistently.

- d. User requirements are the main input for product and service development. Meetings are regularly held to ensure that requirements are current and that product and service development responds to them.

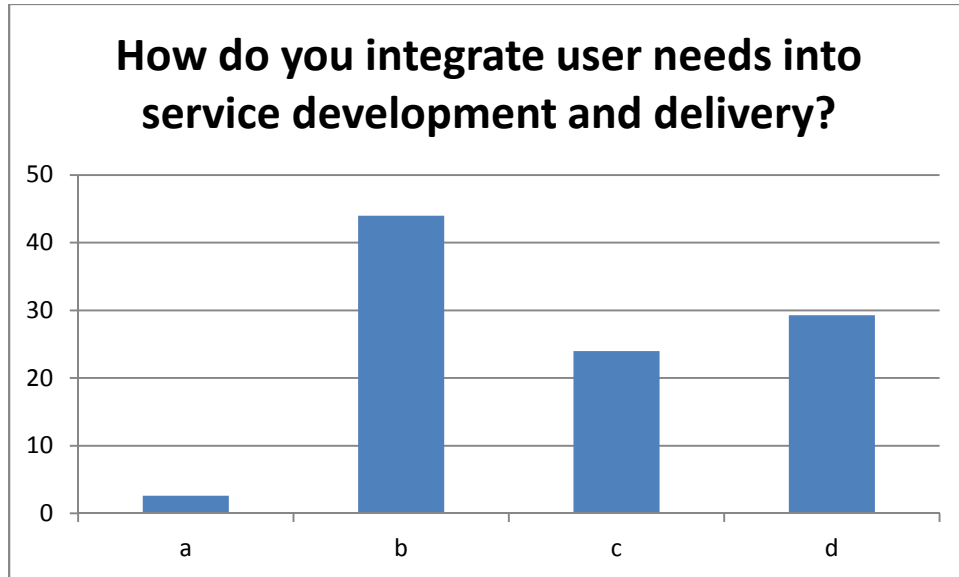


Fig 6: Showing how respondent NMHSs (in percentages) integrate user needs into service development and delivery

75 NMHSs responded to this question. Only two of the respondent NMHSs, representing 2% of them, do not base services on user requirements i.e. category (a). However, the category containing most of the NMHSs is (b) with 44% of NMHSs for which user requirements are sometimes taken into account for development of services, but on an ad hoc basis. Categories (c) and (d) contain 24% and 29% respectively, implying that there is a fairly large number of NMHSs with documented processes for integrating user requirements. However, there is a need to respond to the needs of the NMHSs in the lower categories.

Recommendation

1. The NMHSs at level (a) may wish to consider putting in place formal processes for integrating user requirements into products and service development.
2. NMHSs at levels (b) are already taking user requirements in development of services. However they would need to formalize and document the process of integrating user requirements.
3. NMHSs at level (c) may need to strengthen the processes they are using to ensure that user requirements are the main input for product and service development. This could involve organizing regular meetings with users for this purpose.

Q9 How can WMO assist you with establishing means to communicate service delivery changes to your users? (Please write your answer in the text box below)

Responses received from the respondent NMHSs suggested that WMO could assist them in the following ways:

1. Providing WMO-endorsed best practice examples of service delivery and formats. WMO could facilitate the exchange of the practices at Regional or Sub-regional levels. This recommendation was suggested by about 90 % of the respondents;
2. Organizing for training in user engagement, including on how to inform users of changes in products and services, as well as on communication strategies. This training could be organized at regional, sub-regional and national levels, as appropriate. This request was cited by about 30% of the respondents;
3. Providing guidance materials. This was put forward by about 45% of the respondents;
4. Provide an online platform for convenient communication between members of NMHS on best practices, training information, guidelines etc;
5. Organizing for attachment of staff of NMHSs to advanced NMHSs;
6. Provide NMHSs with any software and templates of other NMHSs, where possible, applicable in different user environments, in the area of Service delivery communication;
7. Sending consultants to establish means of communicating services delivery changes to users;

It may be noted that some NMHSs, notably of developed countries indicated that no support from WMO was required.

Comment

From the responses, it would appear that provision of best-practice examples, development of guidelines and training are the most sought after forms of assistance by NMHSs

5. STRATEGY ELEMENT 3: EVALUATION AND MONITORING OF SERVICE PERFORMANCE & OUTCOMES

Q10 What measures do you have in place to evaluate product accuracy and service utility to users for the purposes of service improvement?

- a. We have no measures in place to evaluate either factor and we make improvements as we think best.
- b. We use some measures on an ad hoc basis to evaluate product timeliness and/or accuracy, which we include as drivers to improve these factors.
- c. We routinely verify accuracy and timeliness of service delivery, and also include user requirements on an ad hoc basis, to include them in strategies for service improvement.
- d. We specify measures for service accuracy and timeliness via an SLA, and routinely schedule interactions with users as additional input towards service delivery.

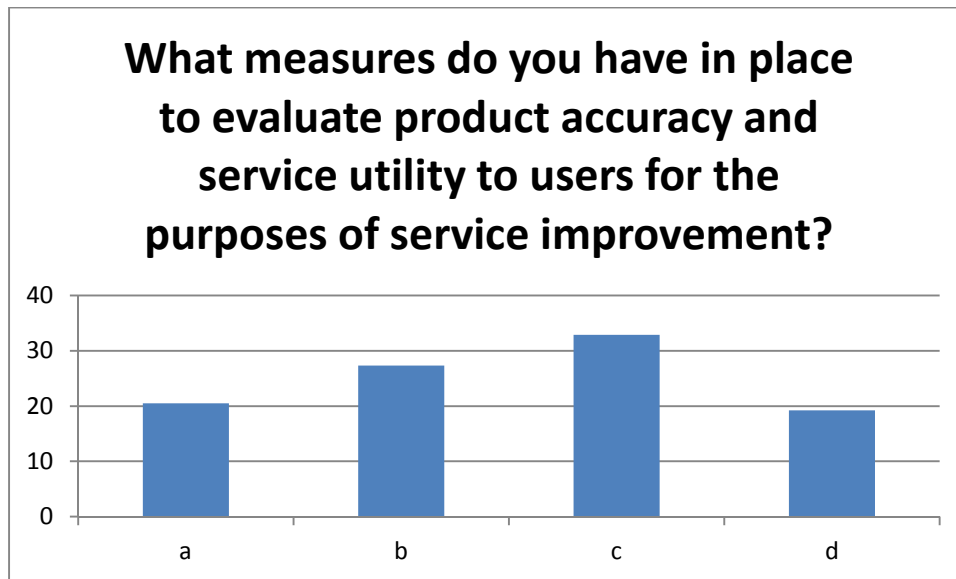


Fig 7: Showing how respondent NMHSs (in percentages) evaluate product accuracy and service utility

Responses

The category with most NMHSs is category (c) at 33%, showing that they routinely verify accuracy and timeliness of service delivery, and also include user requirements on an ad hoc basis to include in strategies for service improvement. 19% of the NMHSs have Service Level Agreement with users, hence are advanced in evaluating products accuracy and service utility. However, 20% of the NMHSs are in category (a), with no

measures in place to evaluate either factor, while 27% are in category (b) has some measures applied on an ad hoc basis.

Recommendations

1. The NMHSs in categories (a) may wish to consider putting in place formal processes for evaluate product accuracy and service utility to users. WMO SSD provides examples of such tools as follows:
 - i. Service Report Template: A template for reporting service delivery performance, timeliness, compliance with product description and achievement of accuracy target (WMO SSD Page 94).
 - ii. Data Spreadsheet for Service Report: An example of a compliance checklist that can be used to assess service delivery performance; it shows how compliance can be checked against a product description (WMO SSD Pages 95 - 96).
2. NMHSs at level (b) would need to put in place a process that ensures that they routinely verify accuracy and timeliness of service delivery and factor in feedback from users for service improvement
3. NMHSs at level (c) may consider specifying measures for service accuracy and timeliness via a formal agreement document with the users such as an SLA.

Q11 Do you assess user satisfaction with your services via customer satisfaction surveys?

- a. We have no means to either formally assess user satisfaction with our services or provide feedback when users are dissatisfied.
- b. We request feedback on user satisfaction on an ad hoc basis at public and professional gatherings, but have no formal process for analyzing the feedback or addressing negative comments.
- c. We have an established means for collecting information on user satisfaction, but do not systematically document these results or respond to suggestions for improvement.
- d. We have a documented user survey process and regularly respond to user suggestions or complaints, and implement changes based validated user requests for change.



Fig 8: Assessment by NMHSs of user satisfaction via customer satisfaction surveys

Responses

The level of service delivery where most NMHSs are, is level (d) at 37%, which represents NMHSs with a documented user survey process which regularly respond to user suggestions or complaints, and implement changes based on validated user requests. 13.7% of NMHSs are in category (c) meaning that they have a process in place but do not document results. In category (a), there are 13.7% of the NMHSs, which have no means to either assess satisfaction or receive feedback when users are dissatisfied. 35.7% of respondent NMHSs are in category (b), where satisfaction assessment is done on an ad hoc basis.

Recommendation

1. NMHSs at level (a) may wish to seek out gatherings of their users at least a few times a year to gather feedback. They could develop a questionnaire for completion by users. Examples of user satisfaction surveys are provided in the [survey webpages](#) of the WMO PWS website. There is also a "[Sample Tried-and-Tested Survey Questionnaires on Service Delivery by NMHSs](#)". Likewise, the "[PWS Summary Guide to Survey Design and Delivery](#)" is provided on the WMO PWS website.
2. For NMHSs which are already at level (b), it is suggested that the survey results they carry out should be documented. They could also consider conducting activities to collect information on user satisfaction. For example, the National Weather service of USA (NWS) conducts Service Assessments to evaluate its performance after significant hydrometeorological events. Assessments may be initiated when one or more of the following criteria are met:
 - Major economic impact on a large area or population;
 - Multiple fatalities or numerous serious injuries;
 - Extensive national public interest or media coverage; or

- Unusual level of attention to NWS performance

As an example of such an assessment, please see "[Service Assessment: Hurricane/Post-Tropical Cyclone Sandy, October 22–29, 2012](#)"³

More examples may be viewed at:

<http://www.nws.noaa.gov/os/assessments/index.shtml>

Q12 What measures have you taken to improve your verification system and evaluation of user satisfaction? (Please write your answer in the text box below).

The measures that NMHSs have used to improve their verification system may be summarized as follows:

1. About 41% of the respondent NMHSs indicated that they assess user satisfaction by carrying out surveys (online or by telephone) at regular intervals and monitoring of feedback channels such as telephone, email or feedback forms.
2. About 30% of respondents reported having no comprehensive measures for improvement of their verification of customer needs, timeliness or accuracy of products.
3. About 13% use face-to-face discussions between NMHSs and users regarding products and services.
4. 10% indicated having dedicated staff undertaking verification of services.
5. 7% of the NMHSs have implemented a Quality Management System (QMS) with metrics for monitoring and evaluating compliance to accuracy and timeliness requirements of product and service delivery.
6. Setting key performance indicators and carrying out evaluation on a regular basis
7. Establishing a user help desk
8. Using an information monitoring system that monitors whether data and information has been well received by users.
9. Suggestions or complaints about services by customers are recorded, discussed by staff and action is then taken to improve service.
10. Using an automatic forecast verification program to determine the accuracy of forecasts.
11. There is the intention in some NMHSs to expand aviation service monitoring and assessment processes to other user services.
12. Publishing verification statistics for the general forecast on websites and providing more targeted verification information to specialized users.

³ Service Assessment: Hurricane/Post-Tropical Cyclone Sandy, October 22–29, 2012:
<https://www.wmo.int/pages/prog/amp/pwsp/documents/Sandy13.pdf>

Observations

1. The usage of survey methods to verify accuracy of forecasts and to evaluate user satisfaction is very popular with NMHSs. The recommendation provided in question 11 above would be very relevant to NMHSs which have indicated having not started the evaluation and monitoring processes.
2. There are many different approaches that NMHSs are using, some of which could be shared among NMHSs as best examples.

6. STRATEGY ELEMENT 4: STRATEGIES FOR SUSTAINING SERVICE DELIVERY IMPROVEMENTS

Q13 How have you documented your service delivery process?

- a. We have no documentation in place to describe our service delivery improvement process.
- b. We have some documentation in place, but not in Quality Management System (QMS) format.
- c. We have a QMS in place for most aspects of service delivery but monitoring of compliance is ad hoc.
- d. Our QMS is used to cover all service delivery processes, compliance is rigorously monitored, and some service processes are used based on results.
- e. Our QMS is used as the basis to evaluate and improve services based on feedback from customers, staff and other users.

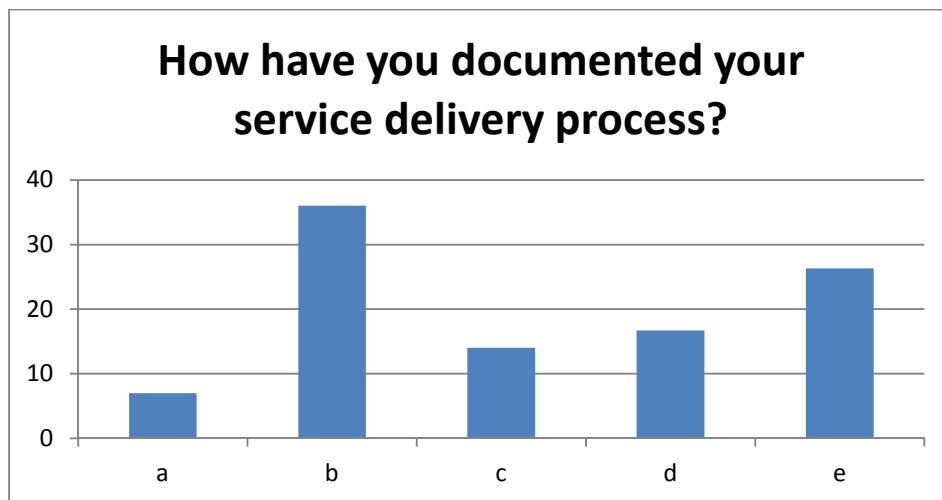


Fig 9: How NMHS document service delivery processes

The majority of respondent NMHSs (36%) are at level (b) indicating that they have some documentation of service delivery processes in place, but not in QMS format. Only 7% of NMHSs have no documentation at all. There is a combined 43% of NMHSs in levels (d) and (e) using QMS in all their service delivery processes, which indicates that there is a good percentage of NMHSs with rigorous documentation of service delivery processes.

Recommendations

1. NMHSs at level (a) may wish to consider introducing into their operations, at least some documentation that describes the services they provide.
2. NMHSs at level (b) may consider introducing documentation in QMS format. An example of such a document is the "Process Description Template": A template used as part of the QMS to describe the processes used to support service delivery improvement (See WMO SSD page 105 – 114).
3. NMHSs at level (c) could consider increasing the rate of compliance with the QMS process to include all the services in order to progress to the next level.
4. NMHSs at level (d) may consider using their QMS process as a basis to evaluate and improve services based on feedback from customers, staff and other users

Q14 How do you integrate advances in Science and Technology (S&T) into service improvement?

- a. We do not review and consider S&T advances as part of our service improvement process.
- b. We review some S&T advances within our service programmes, but have no formal strategy for including them or integrating them into service improvements.
- c. We review S&T advances regularly and develop plans to include some of them into service improvements.
- d. We routinely update our service improvement plans to integrate S&T advances.
- e. We schedule regular meetings for conferences with researchers and developers to jointly explore means for integrating S&T advances into service improvements.

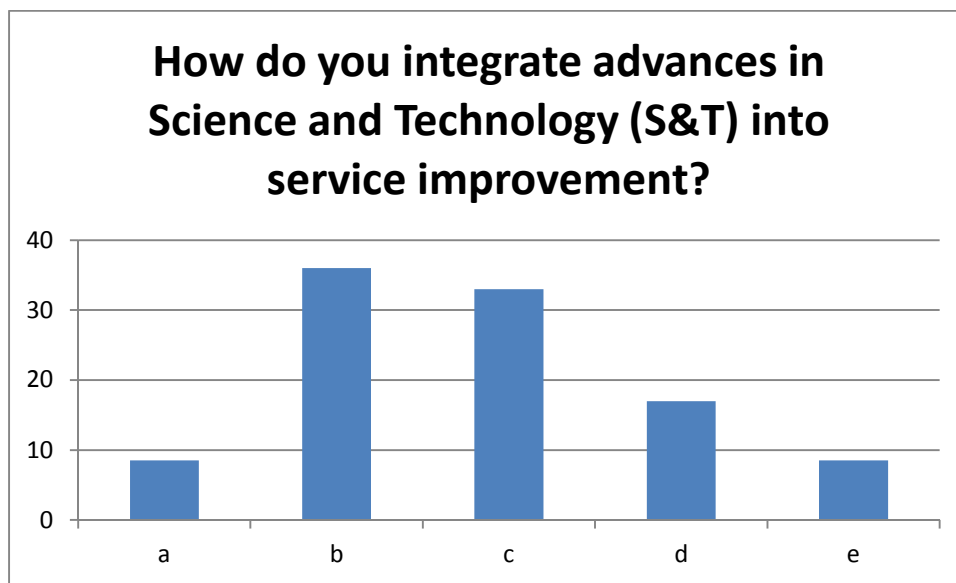


Fig 10: Percentages of NMHS integrating advances in science and Technology into service delivery

Responses

70 NMHSs responded to this question. Of these, the majority of them (36%) indicated that they were at level (b) showing that they review some S&T but have no formal strategy for integrating them into service improvements. Only 8.5% of the NMHSs are at level (a) where they do not review and consider S&T advances for service improvement. Many NMHSs (33%) are at levels (c) showing that they review S&T advances regularly and include them into service improvements but they do not have in place a rigorous process that includes input from researchers and developers. Only 8.5% of NMHSs do this; Level (d).

Recommendations

1. NMHSs at level (a) may consider putting in place a process for reviewing S&T advances as part of the service improvement process. Applications for social media are examples of recent advances that could be useful for reaching the younger generation. The PWS programme has produced the “Guidelines on Participation of National Meteorological and Hydrological Services in the WMO World Weather Information Service”, ([WMO No. 1096, PWS-25](#)).
2. NMHSs at level (b) may consider developing a strategy for reviewing and including S&T advances into service improvements. A team could be charged with the responsibility of reviewing S&T advances regularly for consideration for integration into operations.
3. NMHSs at level (c) could consider updating their existing plans regularly to render them more efficient at identifying and integrating S&T advances into operations.
4. NMHSs at level (d) could contemplate inviting researchers and developers to jointly explore means for integrating S&T advances into service improvements.

Q15 What other approaches (other than as implied in the above two questions) have you utilized to improve your service delivery?

The measures that NMHSs have used to improve service delivery may be summarized as follows:

1. Some NMHSs have integrated advances in S&T to their service delivery systems. For example:
 - a. Australia Bureau of Meteorology is utilizing common data formats to streamline delivery and allow more flexible service options such as interactive web sites and dashboards. They have now transitioned to a digital forecast database of weather elements which enables point and click interrogation of data on the public web and location based services on a mobile device;
 - b. Kenya Meteorological Service has piloted communication to users by use of SMS, and for remote areas they use public forums organized by users and other organizations to provide weather and climate information;
 - c. Customized services to specific customers in the Czech Republic;
2. Raising professional qualifications of staff by participating in training activities
3. MeteoSwiss implemented a new company structure with three departments namely: Measurement & Data; Analyses & Forecasts; and Product management, in order to align more closely with customer needs. The Customer Service was centralized. New customer-focused and product management-focused processes were established.
4. Increasing service delivery channels at the NMHS as well as reinforcing communication between NHMSs and users.

5. Including improvement of service delivery in the strategic and operational plan of the NMHSs
6. Some NMHSs indicated that they had formalized their internal communication processes with regard to customer requirements, as well as adopting WMO guidelines such as the WMO Service delivery Strategic Plan
7. Providing an open web portal with a large amount of data and analysis
8. Setting up an advisory committee on service delivery to provide suggestions on improving service delivery
9. Example of UK Met Office: 24/7 operations centre including a customer service centre for general public queries. As well as scheduling meetings, a wide variety of experts attend different conferences to gather information for service improvements. Met Office also has a Customer Management System called Goldmine that the majority of the Office utilises.
10. Identifying a gap in the market, and successfully filling it, improves service delivery. For example experience in New Zealand shows that identifying a gap in the market may not necessarily be either informed by customer feedback or require the application of "new" science/technology: it may simply be that nobody else has thought of doing it.
11. Some NMHSs are encouraging local universities to take part in inter-disciplinary research including in service delivery.
12. Some NMHSs for example the Meteorological Service of Morocco, have indicated that automation of generation of products is a way of diversifying services and increasing the range of users.
13. The Meteorological service of Belgium mentioned the inter-departmental projects that are regularly organized by the Service for developing innovative products responding to user needs.
14. Certain NMHSs for example the Meteorological Service of Senegal, organize workshops with users in which they discuss products and services the results of which are used to improve service delivery
15. About 20% of NMHSs indicated that they have not implemented any measures to improve service delivery.

7. Strategy Element 5: Developing Needed Skills to Sustain Service Delivery

Q16 What mechanisms do you have in place to develop training requirements for your staff?

- a. We have no mechanisms in place to identify job-based training requirements for our staff.

- b. We have some mechanisms in place for identifying job-based training requirements, but they are neither well-documented nor consistently applied.
- c. We have in place documentation for basic, job-based training requirements, but they are not regularly updated. Training requirements for specialized job needs are not developed.
- d. Requirements for both basic and specialized job-based training are developed and updated on an ad hoc basis.
- e. We regularly work with partners to determine their evolving needs, and regularly update and document associated basic and specialized training requirements accordingly.

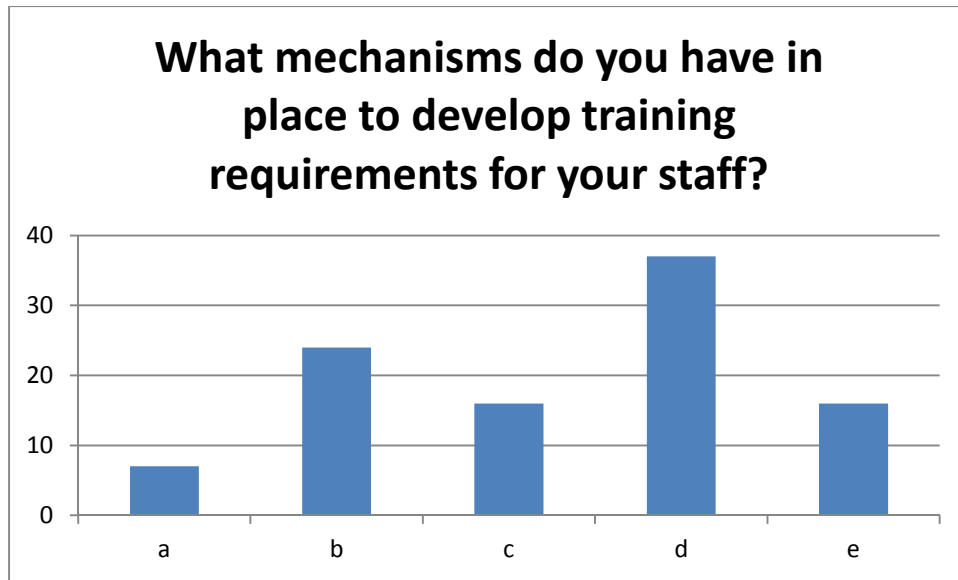


Fig 11: State of implementation of mechanisms by NMHSs for developing training requirements for staff

Responses summary

70 NMHSs responded to this question. Most NMHSs (37%) are at level (d) meaning that they develop and update requirements for both basic and specialized training on an ad hoc basis. However only a few are at level (e) (16%), are working with partners to determine training requirements. It is reassuring to note that there is only a 7% rate of NMHSs at level (a), without mechanisms to identify job-based training requirements.

It would appear from the responses that while many NMHSs have in place some objective and largely effective means of determining training needs, there are nonetheless a substantial number of NMHSs that need improvement in integrating user requirements to training needs and hence progress to the next level.

Recommendations

1. NMHSs at level (a) could start by engaging users, identifying their requirements in order to determine the skills needed by staff in order for them to respond to user requirements effectively. The skills will inform training needs.
2. NMHSs at level (b) could consider putting in place a procedure for ensuring that the training mechanisms are well-documented, consistently applied and updated. This could be made a requirement for the office that coordinates training for the NMHSs.
3. NMHSs at level (c) could ensure to develop a well-documented mechanism encompassing both basic and specialized job-based training needs.
4. NMHSs at level (d) may consider engaging partners to regularly provide information on evolving needs and regularly update and document associated basic and specialized training requirements

Q17 What mechanisms do you have in place to deliver needed training and education to your staff

- a. We have no organized training function within our NMHS and no means for collecting staff input on how to improve their job-based knowledge and skills.
- b. We have an informal process for collecting information from staff on needed training and also rely on informal interactions between staff and management to accomplish training.
- c. We have a documented process for collecting staff training needs but implementation of these needs is accomplished in an ad hoc way based on existing expertise and resources.
- d. We have identified training experts within our NMHS, and a documented process for collecting training requirements and developing associated job-based training and education.
- e. Same as d., except we can engage external training expertise (other NMHSs or private companies) if the training expertise does not exist within our NMHS.

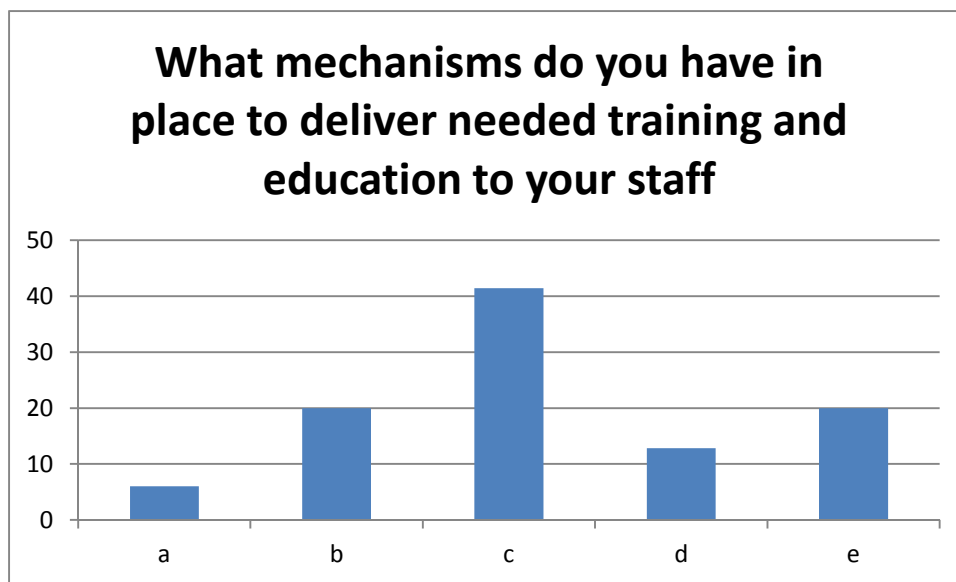


Fig 12: Percentages showing the mechanisms NMHSs have in place to deliver needed training and education to their staff

70 NMHSs responded to this question. Most NMHSs (41.4%) are at level (c) meaning that they operate on a documented training process but in an ad hoc way. A good 20% are at level (e), well advanced in providing training and education. Level (a), which represents a total absence of a training process counts for only 6% of the NMHSs, which is a good thing.

It is apparent from the responses that while a majority of NMHSs are either at a level where development is in progress, developed or advanced, there is a significant percentage of NMHSs where the process are inexistent or just initiated.

Recommendations

1. NMHSs at level (a) could consider initiating a process of consulting with staff through a questionnaire to get their input on how to improve their job-based knowledge and skills, their preferred areas of specialization and current qualifications. The office coordinating training for the Meteorological Service could record details of training undertaken by each staff member etc. This record should be routinely updated and reviewed regularly. It should also be used as an objective tool in determining the staff to be nominated for training when opportunities arise.
2. NMHSs at level (b) may consider aligning training with the required skills to discharge various duties. The WMO SSD provides the example of the Job Description Template: A document used to describe the activities undertaken as part of an individual's or a team's job and the skills, qualifications or experience required to accomplish the job (WMO SSD, pages 115-116).
3. NMHSs at level (c) could start a process to identify training experts within their NMHS and institute a documented process for collecting training requirements and developing associated job-based training and education.

Q18 How can WMO assist you with developing the training and expertise your NMHS needs to ensure staff are equipped to meet your service delivery goals?

The ways that NMHSs have put forward as possible steps that WMO could take in assisting them develop expertise for service delivery goals may be summarized as follows:

1. WMO could provide guidance to NMHSs on how to develop a public weather forecasting competency assessment.
2. Over 60% of the respondent NMHSs indicated that WMO should continue providing training opportunities through workshops, and ensure certification and accreditation. Related comments included a request for WMO to provide e-learning online modules and other training materials, and exchanging and sharing them within WMO regions especially the Regional Meteorological Training Centers (RMTCs).

3. Funding is a big challenge for NMHSs to train in the identified areas. WMO should enhance funding for capacity building.
4. It would be helpful to have some detailed methodology (how to) with examples of best practices in the area of developing training and expertise within NMHSs
5. Sharing best practice

Observation

NMHSs feel that they recognize training needs for service delivery skills set. The main challenge is locating the funding to finance the training as well as finding the fit-for-purpose training. They feel that WMO could assist by ensuring that the necessary guidelines in the area of capacity building for service delivery at NMHSs are available and that training is organized. They suggest development of online training modules, supported by WMO certification and accreditation, as a way of accessing training easily and cost-effectively. There is also a push for sharing of best practices.

Q19 How do you share service delivery best practices across your NMHS?

- a. We have no mechanisms in place to share best practices.
- b. We encourage our staff to share new ideas among themselves for improving service delivery, but have no formal means in place to document these ideas.
- c. We have a process in place for documenting best practices for service delivery and share this document on an ad hoc basis.
- d. We routinely collect and document service delivery best practices and share them with all staff, either via email or a well-publicized web site.
- e. Same as d., except recommended service improvements are also collected from users and shared widely among all staff to ensure user needs are met.

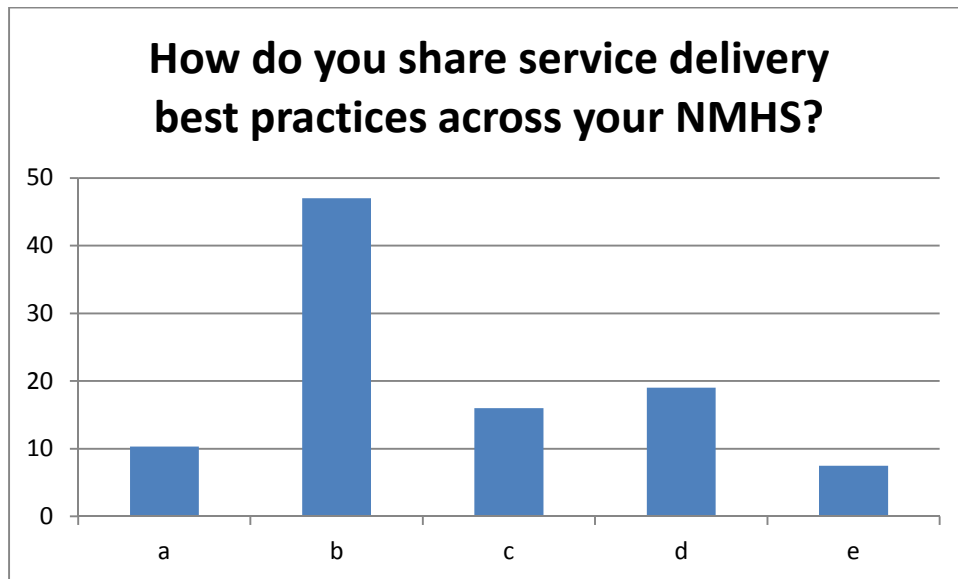


Fig 13: Percentages showing how NMHSs share service delivery best practices internally

68 NMHSs responded to this question. A large majority of them indicated that they were at level (b) (47%), showing that staff share new ideas among themselves for improving service delivery, but have no formal means to document them. 10% of NMHSs are at level (a). Only 7.5% of the NMHSs are at level (e), in which NMHSs involve users in determining best practices.

Recommendation

1. NMHSs at level (a) where no sharing of best practices occurs, may start the practice of collecting and sharing such practices. Simply using the email to share such examples could kick-start the practice.
2. NMHSs at level (b) may consider starting a process for systematically collecting, documenting and sharing best practices among staff. This is one of the Terms of Reference (ToRs) of the national PWS Focal Point. The ToRs and list of the Focal Points is available at [this web link](#).
3. NMHSs at level (c) could initiate implementation of a mechanism for sharing best practices through a website as well as training activities including workshops. A regular review of the status of implementation of the process could be scheduled in the calendar of the NMHS.
4. NMHSs at level (d) could institute a systematic process of integrating users' feedback into the best practices to ensure that any best practices they may adopt respond optimally to the needs of the users.

Conclusions

The following conclusions may be drawn from the outcome of the survey:

1. The survey indicated that in different aspects of service delivery about 5 - 10% of NMHSs have “undeveloped” service delivery, while in about 15 - 23 % of the NMHSs, service delivery has just been initiated but not developed. There is therefore a great need to implement the Strategy in order to attain higher levels development namely, “Development in Progress”, “Developed” and “Advanced” categories.
2. NMHSs indicated that they value adopting examples of processes and mechanisms that may have succeeded in other NMHSs. In conformity with the sentiments expressed in the survey, the WMO PWS programme will collect best practices in the different areas covered in the survey and devise a way for NMHSs to share them.
3. There is a need for WMO to organize training on the areas addressed in the survey. In some cases it may be necessary to develop online training modules on these different aspects of service delivery.
4. In order to enable NMHSs to monitor their own progress in service delivery as recommended in the Service Delivery Progress Model (SDPM) of the WMO SSD, against which this survey was developed, it would be desirable to create a webpage displaying:
 - a. The responses by each respondent NMS to enable them to easily view their current level of service delivery in each area; and
 - b. The suggested actions including guidelines and templates to enable each NMS proceed to at least the next level of service delivery in each area.
5. It would be useful to provide a template into which NMHSs would enter information provided under 4 b. above. This is because these action points together would form a useful “action plan” for the NMHSs to implement in order to progress to more advanced levels of service delivery. This template could be provided online and NMHSs would submit a copy to WMO as a useful tool to inform WMO of the progress of the Implementation Plan of SSD.
6. In order to:
 - a. Enable as many NMHSs as possible to develop action plans aimed improving service delivery; and
 - b. Monitor implementation of the plans,

it is necessary to keep the survey questionnaire open for a few months and request NMHSs to continue to respond to it.

1. List of countries which responded to the survey

1. Afghanistan
2. Albania
3. Argentina
4. Armenia
5. Australia
6. Azerbaijan
7. Bahamas
8. Belarus
9. Belgium
10. Benin
11. British Caribbean Territories
12. Brunei Darussalam
13. Bulgaria
14. Burkina Faso
15. Canada
16. Chad
17. Chile
18. China
19. Colombia
20. Comoros
21. Congo
22. Costa Rica
23. Côte d'Ivoire
24. Croatia
25. Cyprus
26. Czech Republic
27. Dominica
28. Ecuador
29. Egypt
30. Estonia
31. France
32. Germany
33. Greece
34. Guatemala
35. Guinea
36. Guinea-Bissau
37. Guyana
38. Hong Kong, China
39. Hungary
40. Iceland
41. Indonesia
42. Iran, Islamic Republic of
43. Ireland
44. Japan
45. Kazakhstan
46. Kenya
47. Kuwait
48. Latvia
49. Liberia
50. Libya
51. Lithuania
52. Macao, China
53. Madagascar
54. Mauritius
55. Mongolia
56. Montenegro
57. Morocco
58. Nepal
59. Netherlands (the)
60. New Zealand
61. Nigeria
62. Paraguay
63. Peru
64. Poland
65. Qatar
66. Republic of Korea
67. Saint Lucia
68. Senegal
69. Serbia
70. Slovakia
71. Slovenia
72. South Sudan
73. Sri Lanka
74. Sudan
75. Suriname
76. Switzerland
77. Thailand
78. The former Yugoslav Republic of Macedonia
79. Trinidad and Tobago
80. Turkey
81. United Kingdom of Great Britain and Northern Ireland
82. Uruguay
83. Uzbekistan
84. Yemen
85. Zimbabwe

