Results of the IMAP Environmental Assessment of CI 21 in the Mediterranean region

The IMAP Guidance fact sheet for CI 21 **provides the methodology for assessment of this indicator**, This methodology is also aligned with Directive 2006/7/EC.

The methodology used in the EEA 2020 assessment of the state of bathing water quality was as defined in the EU 2006/7 Directive and in IMAP decision IG.20/9, i.e. the classification of the bathing waters was provided according to the 90th or 95th percentile of the log10 normal probability density function of microbiological data. The number of data points for each location was at least 16, over 4 bathing seasons[123], at least 4 for each bathing season.

It should be mentioned that the EU 2006/7 Directive defines two indicators: Intestinal enterococci (IE) (cfu/100 ml) and Escherichia coli (E. coli) (cfu/100 ml). Therefore, the classification of the bathing waters is based on the combination of both microbiological parameters, classifying the stations based on the worse status between the two criteria[124]. For example, if status for IE is excellent but for E. coli the status is poor, the station is classified as poor.

The same methodology used in the EEA 2020 of the state of bathing water quality was applied to data set reported by Montenegro, Morocco and Lebanon, using just intestinal enterococci as indicator.

This methodology could not be applied to data from Bosnia and Herzegovina and Israel because 16 data points for 4 consecutive bathing seasons were not available. Therefore, for these 2 CPs, the classification was based on the geometric mean calculated for each location. The geometric mean was chosen because it reduces the effect of outliers on the mean and is not influenced by skewed distribution as the arithmetic mean.

Comparison between the methodology used by the EEA and the methodology used in present document for the assessment of Bathing waters quality (CI 21)

Assessment methodology	EEA	Present assessment of IMAP CI 21*
Assessment Category	Based on Intestinal enterococci and Escherichia coli (cfu/100 mL)	Based on Intestinal enterococci (cfu/100 mL)
Number of data points	At least 16	Less than 16, depending on the CP*
Number of monitoring years	4	Less than 4, depending on the CP*
Classification of station	percentile evaluation of the log10 normal probability density function	Geometric mean

*Bosnia and Herzegovina and Israel. Lebanon, Montenegro and Morocco were classified using the same methodology as the EEA, based on 16 data points over 4 consecutive bathing seasons, but related to Intestinal enterococci values, only and by applying percentile evaluation of the log10 normal probability density function.

675.	The results of the assessment of the state of bathing water quality for Mediterranean countries, EU Member States and Albania are presented in Figure 3.1.8.1. Most (>90%) of the bathing waters in all countries were in the excellent and good GES classifications. A small percentage of bathing waters were classified as poor D category: 0.1% in Spain, 1% in France, 1.7% in Italy and 3.5% in Albania.

676.	The analysis of data reported into IMAP-IS by Croatia (2021-2022) and Slovenia (2021) indicated that the classification status of bathing water quality for both countries are the same as the status provided in the EEA 2020 assessment shown below in Figure 3.1.8.1.

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[123] Exceptions are outlined in Directive 2006/7/EC and in Decision IG.20/9. Shortly, bathing water quality assessments may be carried out on the basis of three bathing seasons if the bathing water is newly identified or any changes have occurred that are likely to affect the classification of the bathing water. Sets of bathing water data used to carry out bathing water quality assessments shall always comprise at least 16 samples. Only 12 samples may be used to assess bathing water quality in special circumstances when the bathing season does not exceed 8 weeks or location is situated in a region subject to special geographical constraints (Annex IV, paragraph 2).

[124] EEA Guidelines for the assessment under the Bathing Water Directive Prepared by: ETC/ICM (Lidija Globevnik, Luka Snoj, Gašper Šubelj), October 2021

677.	The results of the assessment of the status of bathing water quality performed with data available from IMAP-IS for Lebanon, Montenegro and Morocco are presented below in Figure 3.1.8.1, and for Bosnia and Herzegovina and Israel in Figure 3.1.8.3.

678.	Lebanon. Data were available for 38 stations for the years 2017-2021, although 7 stations had no data available for all years (Table 3.1.8.2) and therefore were not classified due to insufficient data. Out of the 31 available stations, 6 stations were classified as in excellent category, 13 stations as in good category, 4 as in sufficient category, and 8 in bad category. The percentage of the stations in GES (excellent, good and sufficient category) was 74%. Four out of the 8 stations in bad category were classified as such based on data reported for almost all sampling days during all years. The stations were: Dbayeh Public Beach (DBY-2), Antelias – River Mouth (ANT-2), and Beirut (BEY-4, light house and BEY-6 Ramlet-El-Bayda Public Beach). If the 7 stations with insufficient data were considered, the percentage of the stations in-GES would be 61%.

679.	Montenegro: Data were available for 23 stations for the years 2017-2020 (Table 3.1.8.2.). As explained, bathing waters quality in Montenegro was classified using the same methodology as the EEA, at least16 data points over 4 seasons related to Intestinal enterococci values only and by applying percentile evaluation of the log10 normal probability density function. Four stations had data available for only 3 bathing seasons, but they were classified in the same way, based on the exceptions outlined in Directive 2006/7/EC and in Decision IG.20/9. Out of the 23 available stations, 21 were classified in excellent category and 2 in good category.

680.	Morocco: Data were available for 129-147 stations for the years 2018-2021 (Table 3.1.8.2). Sixteen stations were not sampled at each year and therefore could not be classified[125]. Out of the 131 available stations, 45 stations were classified in excellent category, 49 stations in good category, 17 in sufficient category and 20 in bad category. The percentage of the stations in GES (excellent, good and sufficient category) was 85%. If the 16 stations with insufficient data were taken into account, the percentage of the stations in-GES would be 76%.

681.	Bosnia and Herzegovina: Data were available for 3 stations for the years 2017-2021 (Table 3.1.8.2). All 3 available stations were classified in excellent category.

682.	Israel: Data were available for 105 stations for 2021 (Table 3.1.8.2). All the stations were classified in excellent category.

683.	In line with the findings on the status of bathing water, as elaborated above, and shown in Figures 3.1.8.1; 3.1.8.2; 3.1.8.3, the Mediterranean bathing waters can be classified in GES (excellent, good and sufficient status), whereby percentage are higher than 85% for the CPs for which the assessment was undertaken. Only for Lebanon the percentage of stations in GES were 74%, however, mainly due to 4 stations. The confidence of this evaluation is high for areas with sufficient data points and bathing seasons, and less so for areas with less data. Some areas of the Mediterranean could not be assessed given no data were reported.

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[125] Stations can be classified only if at least 12 sample results, spread over 3-4 bathing seasons, are available. Non-classified stations could be either in-GES or non-GES.
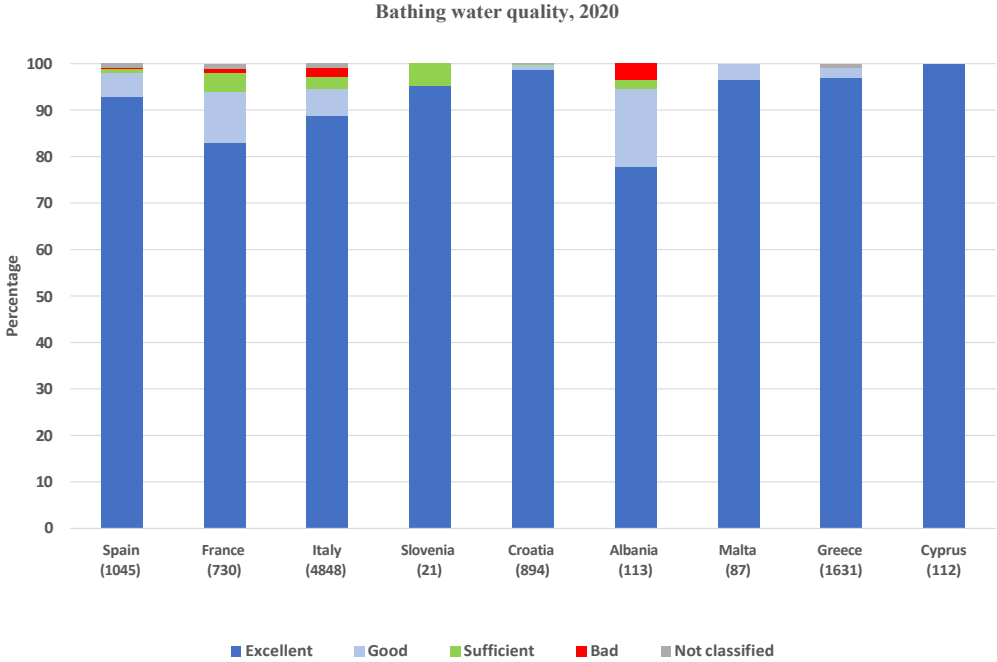
Bathing water quality, 2020

Figure 3.1.8.1: The 2020 bathing water quality assessment related to IMAP CI 21, for a group of the Contracting Parties to the Barcelona Convention. (Source: EEA, 2020). In parenthesis, the number of stations.
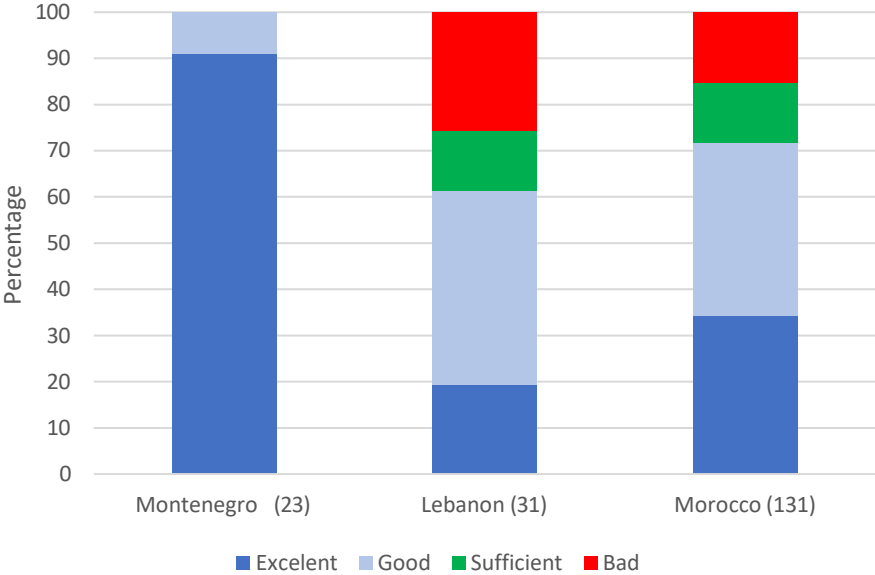

Figure 3.1.8.2: The bathing water quality assessment related to IMAP CI 21,for Lebanon, Montenegro and Morocco (Source IMAP Info System). In parenthesis, the number of stations.
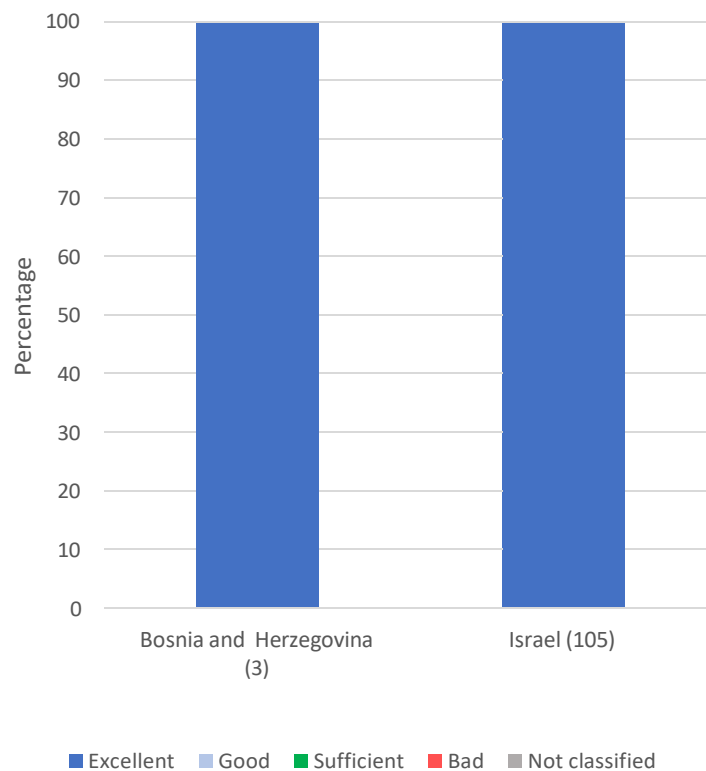
Figure 3.1.8.3: The bathing water quality assessment related to IMAP CI 21 for Bosnia and Herzegovina, and Israel. (Source: IMAP Info System). In parenthesis, the number of stations.

684.   The sub-regions with good representation were the Adriatic Sea Sub-region (ADR) with data from all the Adriatic countries (partial data for Bosnia and Herzegovina); and the Western Mediterranean Sea Sub-region (WMS) (with data from Morocco, Spain, France and Italy). The Central Mediterranean Sea Sub-region (CEN) had data from Italy, Malta and Greece, while the Aegean and Levantine Seas (AEL) Sub-region had data from Greece, Cyprus, Lebanon and Israel (partial).

685.   Most of data were available through EEA and not through IMAP IS, even up to October 31st, the cut off data for reporting for the 2023 MED QSR. It must be noted that the lack of data reporting for IMAP CI 21 into IMAP IS is a key obstacle to undertake related assessments for the preparation of the 2023 MED QSR. The evaluation of the state of the Mediterranean bathing waters should be improved by reporting additional data from the sub-regions/ sub-divisions with low quantity of data or no data reported. Therefore, the present assessment findings call on CPs to report monitoring data related to IMAP CI 21 so that they can be considered in the future, especially in the case of the countries that have established monitoring programs for CI 21 and regularly implement them.

686.   It also must be noted that sufficient data reporting i.e., 16 data points for 4 consecutive bathing seasons would allow the application of uniform assessment methodology across the Mediterranean, therefore increasing the comparability and consistency of the assessment findings.

687.   Compared to the 2017 MED QSR, the current assessment includes five CPs instead of one CP with data reported to IMAP IS, along with the CPs assessed within the EEA 2020 assessment of the state of bathing water quality. However, lack of data reporting to IMAP IS implies the use of different assessment approaches that may bring certain discrepancy. Although the present situation is better than in 2017, more data must be reported by the CPs in order to provide comparable and consistent assessment findings.