Indicator Fact Sheet

(WEU11) Bathing Water Quality

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Key Message

☺ The quality of water at designated bathing beaches in Europe (coastal and inland) has improved throughout the 1990s. In 2002, 96% of coastal bathing waters and 91% of inland bathing waters complied with the mandatory standards.

☹ Despite this improvement, 13% of Europe's coastal bathing waters and 36% of Europe's inland bathing beaches still do not meet (non-mandatory) guide values even though the bathing water directive was adopted almost 25 years ago. In addition studies have shown that even meeting guide values does necessarily protect public health.

Figure 1a: Percentage compliance of EU coastal bathing waters with mandatory and guide values of the Bathing Water Directive, 1992 to 2002 for EU-15

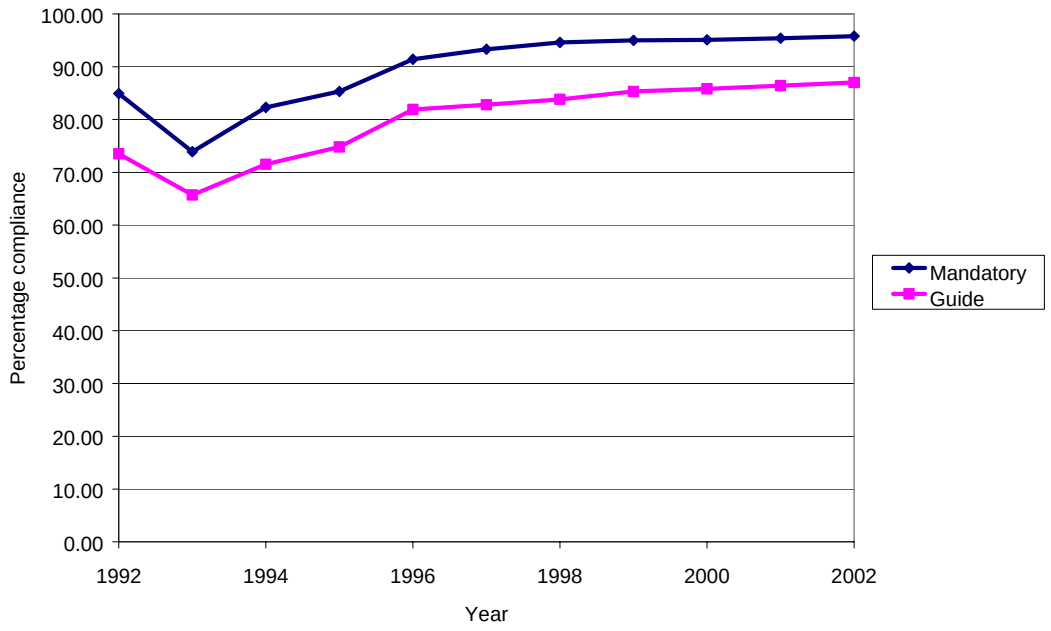
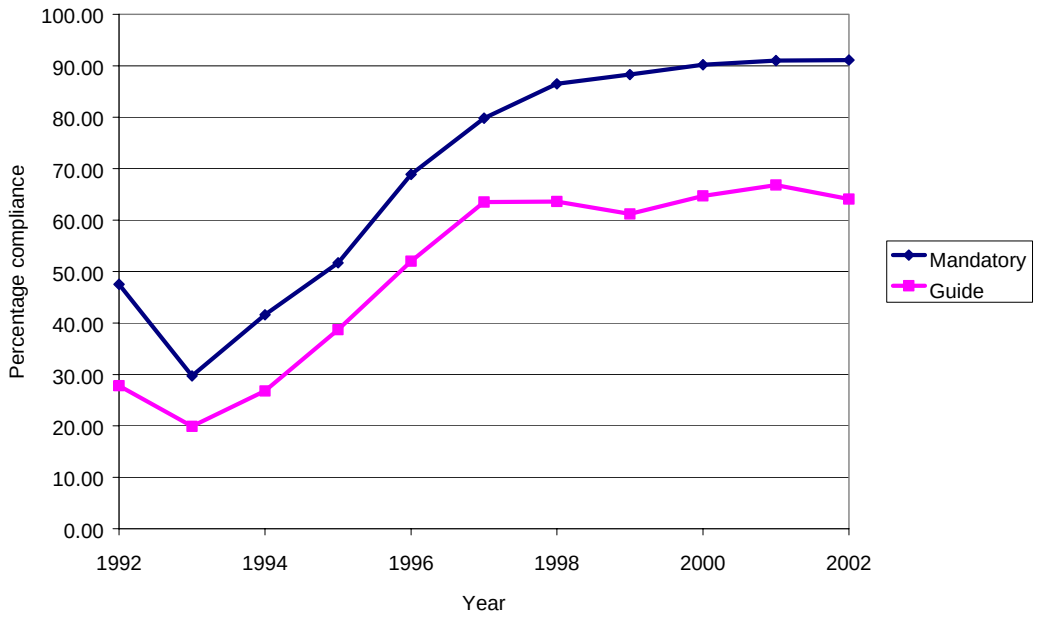


Figure 1b: Percentage compliance of EU Inland bathing waters with mandatory and guide values of the Bathing Water Directive, 1992 to 2002 for EU-15



Source: The European Commission from annual reports by EU Member States

Results and assessment

Policy relevance:

The Bathing Water Directive (76/160/EEC) was designed to protect the public from accidental and chronic pollution incidents, which could cause illness from recreational water use. Examining compliance with the bathing water directive therefore indicates the status of bathing water quality in terms of public health and also the effectiveness of the directive.

On 24 October 2002, the Commission adopted the proposal for a revised Directive of the European Parliament and of the Council concerning the Quality of Bathing Water COM(2002)581. The proposed Directive makes use of only two bacteriological indicator parameters, but sets a higher health standard than the 1976/160 Directive. Based on international epidemiological research and on the experience with implementing the current Bathing Water and Water Framework Directives, the revised Directive provides long-term quality assessment and management methods in order to reduce both monitoring frequency and monitoring costs. Well-developed management of bathing waters and extensive information given to the public replace a pure monitoring and retrospective compliance approach.

Policy context:

Under the Bathing Water Directive (76/160/EEC) member states are required to designate coastal and inland bathing waters and to monitor the quality of the water throughout the bathing season. Bathing waters are designated where bathing is authorised by the competent authority and also where bathing is traditionally practised by a large number of bathers. The bathing season is then determined according to the period when there are the most number of bathers (May to September in most European countries). The quality of the water has to be monitored fortnightly during the bathing season and also two weeks before. The sampling frequency may be reduced by a factor of two when samples taken in previous years show better results than guide values and when no new factor likely to lower the quality of the water has appeared. Annex 1 of the directive lists a number of parameters to be monitored but the focus has been on bacteriological quality. Human enteric viruses are the most likely pathogens responsible for waterborne diseases from recreational water use but detection methods are too complex and costly for routine monitoring and so the main parameters analysed for compliance with the directive are indicator organisms; total and faecal coliforms.

The directive sets both minimum standards (mandatory) and optimum standards (guide). For compliance with the directive, 95% of the samples must comply with the mandatory standards. To be classified as achieving guide values, 80% of the samples must comply with the total and faecal coliform standards and 90% with the standards for the other parameters.

Environmental context:

The Bathing Water Directive is one of the oldest pieces of environmental legislation in Europe and so data on compliance are available going back to the 1970s.

The focus of the legislation is on human health but since contamination arises from the discharge of effluents into recreational waters and also from diffuse sources such as run off from agricultural land, compliance is also indicative of the water quality more generally. It is also indicative of the effectiveness of other environmental legislation, such as the Urban Waste Water Treatment Directive (UWWTD).

Assessment:

The percentage of bathing areas in Europe that were sufficiently sampled which comply with the mandatory values and the guide values in the Directive 76/160/EEC on Bathing Water Quality has increased from 1992 to 2002 for coastal and inland bathing waters (figure 1a and b).

In 2002, only The Netherlands has reached 100% compliance with the mandatory standards in coastal waters, even though the legislation has been in place for almost 25 years and despite the investment and improvement in waste water treatment. In some cases the installation of sewage treatment works has not achieved 100% compliance and has identified the importance of diffuse pollution (e.g. Morecambe Bay, UK (Jones et al 1999).

In addition, for some of the parameters listed in the directive robust, analytical methodology still has not been developed (e.g. for monitoring viruses). Compliance, therefore, with the mandatory standards (total coliforms, 10,000 per 100ml and faecal coliforms, 2,000 per 100ml) does not necessarily mean that there is no risk to human health. In fact, a number of studies have shown that the concentration of faecal streptococci in bathing water is a more useful indication of the likelihood of illness than faecal coliforms (eg. Cabelli, 1983 and Kay et al, 1994). There is a guide value in the directive for faecal streptococci (100 per 100ml) but Kay et al (1994) found there was a significantly increased risk of gastroenteritis when faecal streptococci was greater than 40ml per 100ml and so even reaching the guide value does not necessarily protect human health.

Sub-indicator: Compliance of EU bathing beaches with the Bathing Water Directive

Key Message

⊙ In 2002, Greece and Italy had the highest percentage of coastal bathing waters reaching the (non-mandatory) guide values, and Denmark and Germany had the highest percentage of inland bathing waters.

⭘ In 2002, Belgium had the lowest percentage of coastal bathing waters reaching the (non-mandatory) guide values, and Portugal the lowest percentage of inland bathing waters.

Figure 2a: Percentage compliance of EU coastal bathing beaches with mandatory standards and guide standards of the Bathing Water Directive, for the year 2002 by country

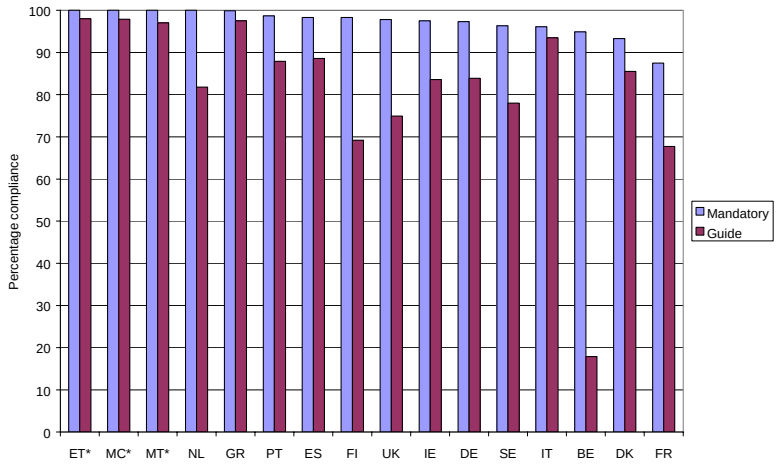
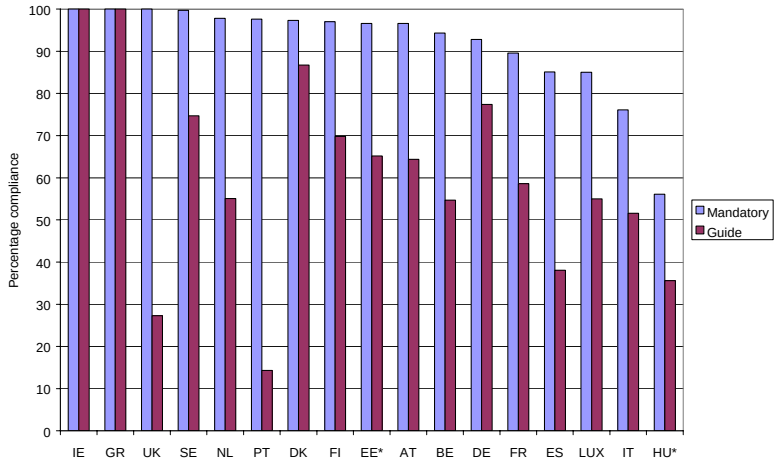


Figure 2b: Percentage compliance of EU inland bathing beaches with mandatory and guide values of the Bathing Water Directive for the year 2002 by country



Source: The European Commission from annual reports by EU Member States. The Kiev questionnaire.

Assessment of the sub-indicator

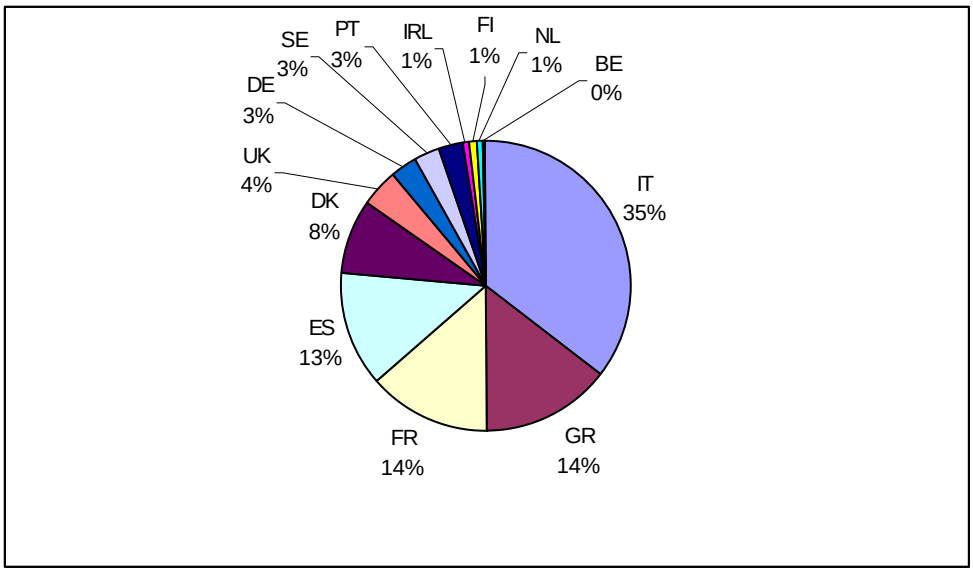
For the EU-15 countries, Greece and Italy had the highest percentage of coastal waters reaching the (non-mandatory) guide values, Belgium the lowest (Figure 2a). Denmark and Germany had the highest percentage of inland bathing waters reaching the guide values and Portugal the lowest (Figure 2b). In addition to the EU-15 countries, data for Malta, Monaco, Estonia and Hungary have been collected from countries and introduced in Figures 2a and 2b for information (2001 results).

Sub-indicator: Designated bathing waters in the EU-15

Key Message

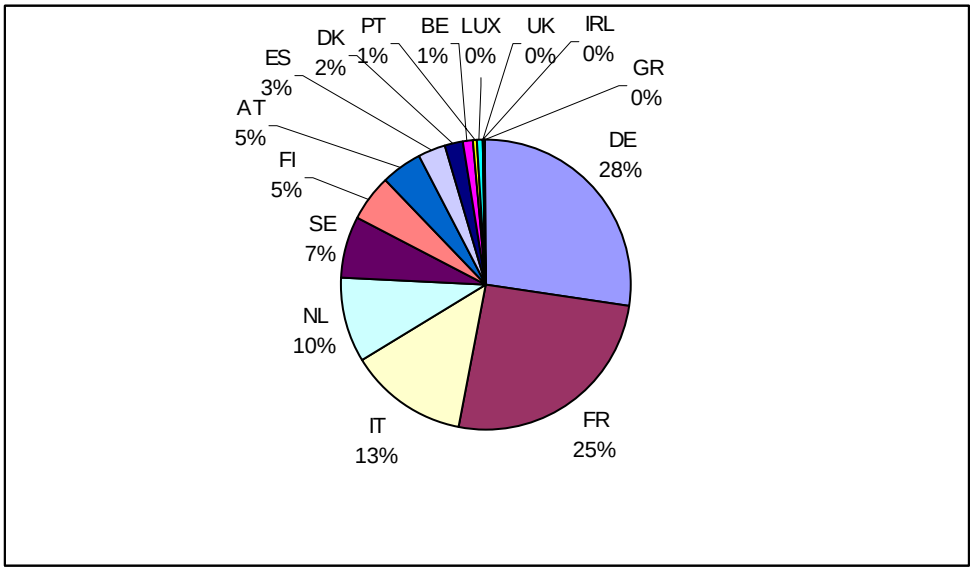
⦿ Italy and Greece have the most coastal bathing water designations and Belgium and the Netherlands the least. Germany and France have the most inland bathing water designations and Greece, Ireland and the UK the least.

Figure 3a: Designated <u>coastal</u> bathing waters per country as a percentage of the total designations for the year 2002 for EU-15. [Total bathing waters 13 627]



Source: The European Commission from annual reports by EU Member States

Figure 3b: Designated <u>inland</u> bathing waters per country as a percentage of the total designations for the year 2002 for EU-15. [Total 5773]



Source: The European Commission from annual reports by EU Member States

Assessment of the sub-indicator

Figures 3a and 3b show the proportionate distribution of bathing water designations in the different European countries (EU-15). Italy and Greece have the most coastal bathing water designations and Belgium and the Netherlands the least (Figure 3a). This is unsurprising considering the relative area of coastline for those countries and the climate. Germany and France have the most inland bathing water designations and Greece, Ireland and the UK the least

References

Cabelli, V. 1983. **Health effects criteria for marine recreational waters.** EPA-600/1-80-031. U.S. Environmental Protection Agency, Health Effects Laboratory, Research. Triangle Park, NC.

European Commission (2003) **Quality of bathing water (2002 bathing season)** http://europa.eu.int/water/water-bathing/report.html

Jones, K. and Obiri-Danso, K. (1999) **Non-compliance of beaches with the EU directives of bathing water quality: Evidence of non-point sources in Morecambe Bay** Journal of Applied Microbiology Symposium Supplement, Vol 85, issue 28 pp 101S-107S.

Kay, D., Fleischer, J. M., Salomon, R. L., Jones, F., Wyer, M. D., Goodfree, A. F., Zelenauch-Jacquotte, Z. and Shore, R. (1994). **Predicting likelihood of gastro-enteritis from sea bathing results from randomised exposure**. Lancet 344, pp 905-909.

http://europa.eu.int/water/water-bathing/index_en.html

Data

Spreadsheet:

WEU11_BathingWaterDatav2.xls

Table 1: Percentage compliance of EU coastal bathing waters with mandatory and guide values of the Bathing Water Directive, 1992 to 2002

Year	Mandatory	Guide
1992	84.90	73.50
1993	73.90	65.70
1994	82.30	71.50
1995	85.30	74.80
1996	91.40	81.90
1997	93.30	82.80
1998	94.60	83.80
1999	95.00	85.30
2000	95.10	85.80
2001	95.40	86.40
2002	95.80	87.00

Table 2: Percentage compliance of EU inland bathing waters with mandatory and guide values of the Bathing Water Directive, 1992 to 2002

Year	Mandatory	Guide
1992	47.50	27.80
1993	29.70	19.90
1994	41.60	26.80
1995	51.70	38.70
1996	68.90	52.00
1997	79.80	63.50
1998	86.50	63.60
1999	88.30	61.20
2000	90.20	64.70
2001	91.00	66.80
2002	91.10	64.10

Table 3: Percentage compliance of EU coastal bathing beaches with mandatory standards and guide standards of the Bathing Water Directive, for the year 2002 by country

	ET*	MC*	MT*	NL	GR	PT	ES	FI	UK	IE	DE	SE	IT	BE	DK	FR
Mandatory	100	100	100	100	99.9	98.7	98.3	98.3	97.8	97.5	97.3	96.3	96.1	94.9	93.3	87.5
Guide	98	97.9	97	81.8	97.5	87.9	88.6	69.2	74.9	83.6	83.9	78	93.5	17.9	85.5	67.7

*: 2001 results

Table 4: Percentage compliance of EU inland bathing beaches with mandatory and guide values of the Bathing Water Directive for the year 2002 by country

	IE	GR	UK	SE	NL	PT	DK	FI	EE*	AT	BE	DE	FR	ES	LUX	IT	HU*
Mandatory	100	100	100	99.7	97.8	97.6	97.3	97	96.6	96.6	94.3	92.8	89.6	85.1	85	76.1	56.1
Guide	100	100	27.3	74.7	55.1	14.3	86.7	69.8	65.2	64.4	54.7	77.4	58.6	38.1	55	51.6	35.6

*: 2001 results

Table 5: Number of designated coastal bathing waters per country

Year	BE	DK	DE	GR	ES	FR	IRL	IT	LUX	NL	AT	PT	FI	SE	UK	Total
1992	39	1173	438	1203	1335	1932	90	4034		46		227			455	10972
1993	39	1180	435	1250	1405	1856	90	4286		51		312			457	11361
1994	39	1190	442	1281	1490	1870	108	4541		54		315			457	11787
1995	39	1188	438	1526	1518	1874	108	4592		47		334	100	250	464	12478
1996	39	1196	426	1690	1572	1846	115	4688		87		338	101	391	472	12961
1997	39	1195	416	1701	1588	1829	115	4836		82		336	94	401	486	13118
1998	39	1194	417	1733	1597	1856	121	4868		78		342	94	378	496	13213
1999	39	1177	414	1816	1624	1829	121	4811		78		342	93	379	541	11429
2000	39	1161	411	1858	1633	1846	121	4820		78		345	113	372	551	11502
2001	39	1160	408	1887	1637	1859	122	4824		77		366	120	378	552	13429
2002	39	1155	403	1914	1773	1869	122	4850		77		373	117	382	552	13627

Table 6: Number of designated inland bathing waters per country

Year	BE	DK	DE	GR	ES	FR	IRL	IT	LUX	NL	AT	PT	FI	SE	UK	Total
1992	85	109	1826	4	301	1754	5	621	20	567						5292
1993	85	108	1730	4	312	1660	5	667	20	515		24				5130
1994	86	110	1917	4	346	1660	9	681	20	534		24				5391
1995	87	111	1830	4	222	1640	9	695	20	543		26	378	352		5917
1996	55	113	1810	4	302	1648	9	697	20	505		26	391	488		6068
1997	56	112	1723	4	251	1587	9	740	20	505	268	24	360	522		6181
1998	55	113	1656	4	215	1553	9	737	20	522	270	24	357	462	9	6006
1999	52	114	1639	4	213	1455	9	724	20	528	270	37	343	412	11	4376
2000	51	115	1615	4	202	1493	9	711	20	557	268	42	332	401	11	4338
2001	50	115	1602	4	185	1492	9	726	20	554	267	38	314	396	11	5783
2002	53	113	1593	4	181	1457	9	762	20	557	267	42	305	399	11	5773

Meta data

Web presentation information

1. Abstract / description / teaser:

By examining compliance with the bathing water directive the indicator indicates the status of bathing water quality in terms of public health and the effectiveness of the directive.

2. Policy issue / question:

Do we meet the standards of the Bathing Water Directive?

3. EEA dissemination themes:

Water

4. DPSIR:

S

Technical information

5. Data source: The European Commission from annual reports by EU Member States
6. Description of data: Percentage compliance with standards laid down in the Bathing Water Directive
7. Geographical coverage: EU15. Malta, Monaco, Estonia and Hungary for 2001
8. Temporal coverage: 1992 to 2002
9. Methodology and frequency of data collection. EU Member States report electronically to the European Commission by the end of each year for the preceding bathing season. The Commission publishes the results before the start of the next bathing season.
10. Methodology of data manipulation. EU aggregations of Member States summaries of compliance with mandatory standards and guide values.

Quality information

11. Strength and weakness (at data level): Data is supplied to the Commission as pass/fail for the various parameters. Raw data is not provided. No data are regularly available from EU Accession Countries, nor the EFTA countries.
12. Reliability, accuracy, robustness, uncertainty (at data level): An electronic transfer system has been used successfully for many years. Data validation is undertaken by Member States and the Commission.
13. Overall scoring:

Relevancy: 1

Accuracy: 1

Comparability over time: 2

Comparability over space: 2

Further work required

The indicator will change with the implementation of the new Bathing Water Directive. Comparable data are also required from other EEA countries on a regular basis.