



Delivering Healthy Water

Decision Making Framework (DMF)

May 2013

Introduction

Delivering Healthy Water (DHW) is a project funded by the Natural Environment Research Council (NERC) that promotes the exchange of knowledge and information between science providers, science users and the public with regard to advantages and limitations of different tools for compliance monitoring of bathing waters and other regulated waters. The aim of the project is to develop a shared understanding of the science evidence base underpinning current and emerging microbial quantification techniques.

Alongside this DMF are two briefing papers that present the evidence gathered from academics, policy makers, regulators and other stakeholders during the course of this project.

Briefing Paper 1 focused on the scientific, regulatory and policy questions surrounding a potential move to using molecular methods for compliance monitoring of bathing waters and other regulated waters.

Briefing Paper 2 addressed the economic implications of such a move and the complexities of providing appropriate and timely public information on bathing water quality.

Both can be viewed and downloaded from the DHW website www.deliveringhealthywater.net

Notes

This DMF is a tool to assist organisations in deciding whether it is appropriate to move towards using molecular methods for compliance monitoring of bathing water quality. It is part of the DHW briefing paper series described above and helps to address the question

“Do we need to do more to evaluate and communicate bathing water quality to protect and manage human health?”

Moving to the use of faster molecular techniques may be one means by which we can improve the evaluation of health risks associated with bathing water quality. There are three strands to consider with respect to the overarching question. In this DMF we focus on compliance monitoring but the blending of this with communication depicts the importance of that link.

- Figure 1 gives the question and the three strands to which it applies.
- Figure 2 illustrates how this DMF is set within the compliance monitoring strand.
- Figure 3 presents the DMF in flowchart format.
- Figure 4 provides a glossary of terms used.
- Figure 5 and figure 6 provide an alternative format for the DMF that can either be used with or instead of the flow chart. Rankings are selected in figure 5 and fed into figure 6 to determine the appropriate scenario and course of action.

Additional evidence is available in the DHW Briefing Papers and this is indicated on Figure 4 where supporting information may help in the decision making process.

**Do we need to do more to evaluate
and communicate bathing water
quality to protect and manage
human health?**

Communication

Compliance monitoring

Control and management

Figure 1

Do we need to do more to evaluate and communicate bathing water quality to protect and manage human health?

Communication

Compliance monitoring

Control and management

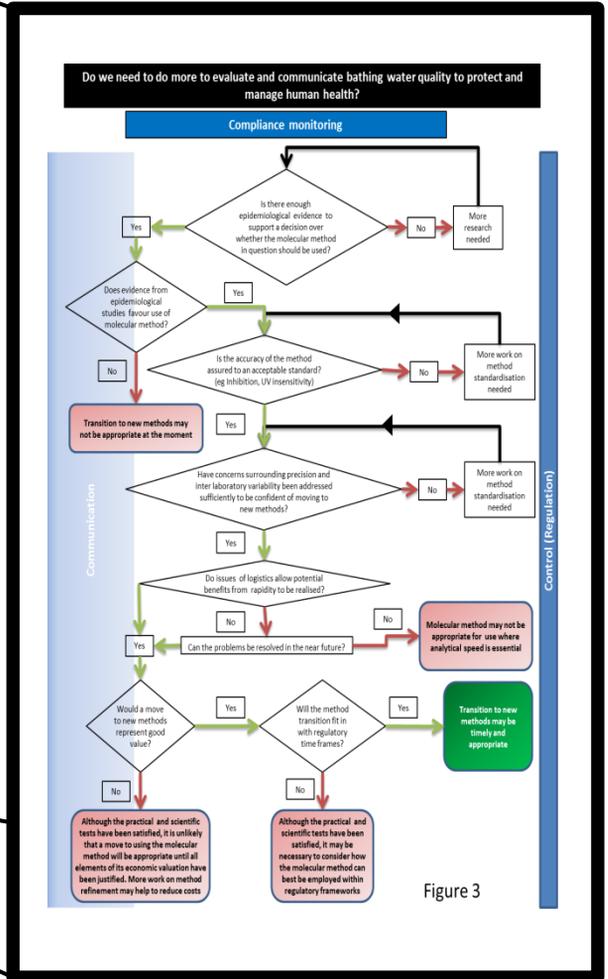


Figure 3

Figure 2

Do we need to do more to evaluate and communicate bathing water quality to protect and manage human health?

Compliance monitoring

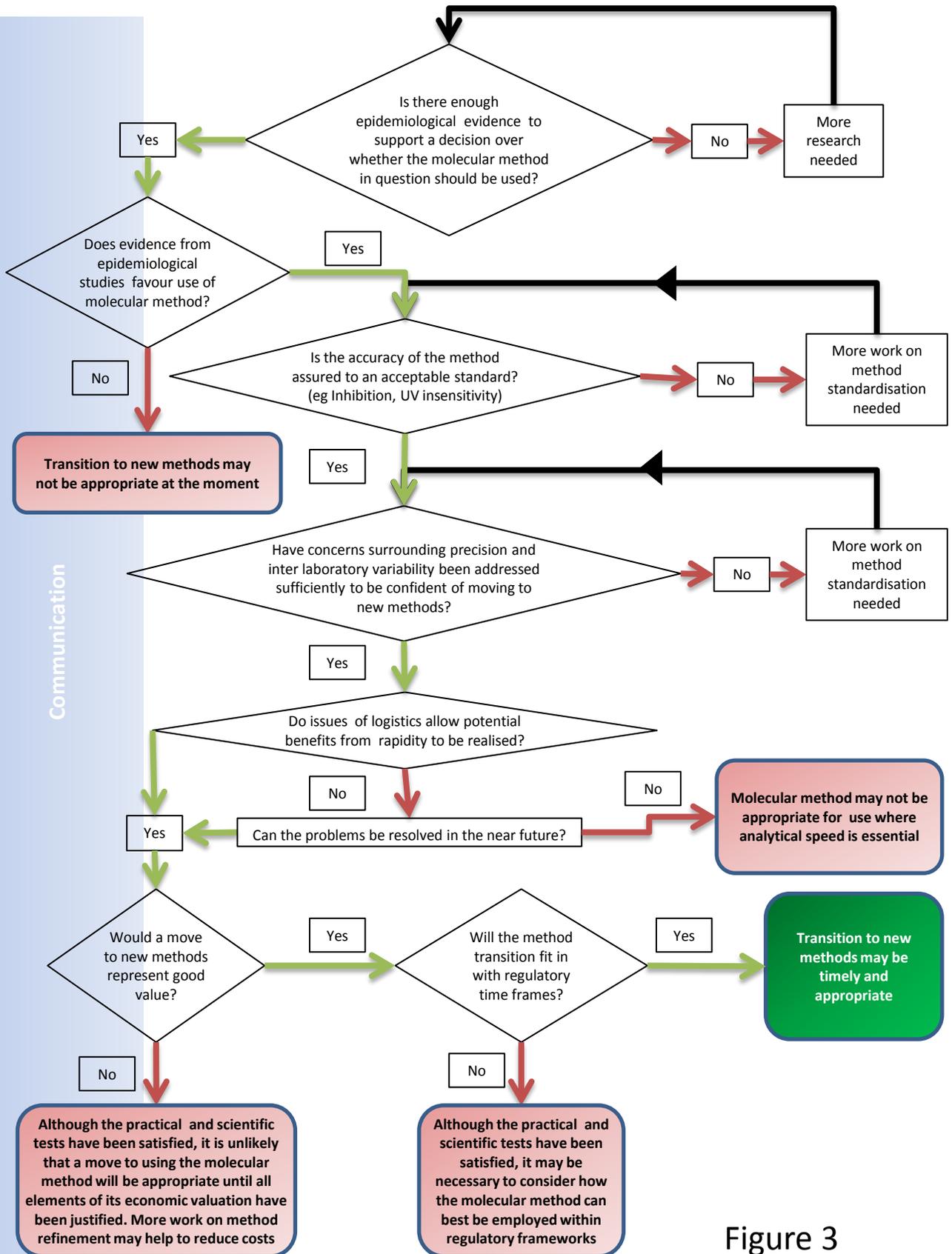


Figure 3

Key:

Epidemiological evidence.

- Studies relating specific FIOs or markers to human health risks that allow appropriate targets to be selected with confidence across wide geographical areas.

Supporting information available in Briefing Paper 1

Accuracy.

- A degree of certainty that analytical procedures generate data that is robust enough to be used for its intended purpose and give a true representation of the population being measured within a defined and acceptable level of confidence.

Supporting information available in Briefing Paper 1

Precision.

- A level of reproducibility between laboratories that is suitable for data reporting.

Supporting information available in Briefing Paper 1

Rapidity & logistics.

- The amount of practical benefit achievable from the increased speed in sample turnaround time.

Supporting information available in Briefing Paper 1

Value for money.

- Confidence that the new methods will be cost effective, even if more expensive and;
- Taking into account direct and indirect costs and an economic valuation of the benefits of better and faster information about bathing water quality.

Supporting information available in Briefing Paper 2

Time frame for implementation.

- The likelihood of introducing the new methods into standard practice within an appropriate policy and regulatory time frame.

Supporting information available in Briefing Paper 1

Ranking	1	2	3
Epidemiological evidence	Epidemiological evidence is available and robust enough to support the use of a new method.	Some epidemiological studies have been carried out or are in progress. While the evidence to date is not strong enough to support a move to using a new method, indications are positive that this will be resolved in the near future.	Epidemiological studies are lacking or those that have been carried out are not supportive of change.
Accuracy of method	Evidence suggests that the methods produce data that represent the true values of target organisms to an acceptable level of accuracy.	One or more studies exist that highlight shortcomings in the accuracy of the new method and more work is needed to resolve this problem.	Accuracy of the new method is still not reliable enough to allow it to be used with confidence.
Precision between laboratories	Precision between laboratories is proven and robust. We can be satisfied that measures can be implemented to ensure adequate precision.	Shortcomings of precision between laboratories have been identified and work is needed to address this.	Precision is still unreliable and large questions remain over variability of results between laboratories.
Rapidity and logistics	The faster turnaround time offered by new methods is crucial to its use in this area. The logistics are such that this benefit can be maximised.	Logistics of realising the time benefits of new methods are understood and changes in working practice are available to achieve this to some extent.	The extra speed offered will not make a crucial difference and other logistical constraints negate this benefit.
Cost effectiveness	There is compelling evidence to support the view that the new method will not be more expensive than existing culture based methods.	The new method may be more expensive and the overall cost effectiveness will need to be assessed taking into account the perceived benefits of the new method.	Evidence points towards inevitable and prohibitive extra costs associated with the new method.
Time frame	Everything is in place to allow the transition to the new method within an appropriate regulatory time frame.	There is still a lot of uncertainty surrounding the realistic time frame for implementation.	Evidence points towards it being unlikely that a transition to using the new method is achievable with an appropriate timeframe.

Figure 5

Scenario	Epidemiological evidence	Accuracy	Precision	Rapidity and logistics	Cost	Time frame	Action
1	3	1-3	1-3	1-3	1-3	1-3	A
2	2	3	2-3	1-3	1-3	1-3	A
3	2	1-2	1-2	1-2	1-2	1-2	B
4	1	3	3	1-3	1-3	1-3	B
5	1	1-2	1-2	3	3	3	B
6	1	1-2	1-2	1-2	1-2	1-2	C
7	1	1	1	1	1	1	D

- A. It would not be appropriate to invest in changes to the way bathing water quality is evaluated and communicated at present because epidemiological evidence is not available or does not support a change.
- B. A move towards using rapid methods for evaluating bathing water quality is inadvisable at present due to a lack of certainty in one or more of the critical lines of evidence but preparations could be made for a transition in the near future as the indications are that these matters will be resolved.
- C. A move towards using rapid methods for evaluating bathing water quality may be appropriate but caution is advised as there remains some uncertainty surrounding one or more of the lines of evidence.
- D. Sufficient evidence exists to support the allocating of resources towards the use of rapid methods immediately.

Figure 6

This project has been funded by the Natural Environment research Council (NERC) and led by the University of Stirling. It is supported by Lancaster University and Aberystwyth University.

The core Working Group includes a membership of representatives from UKWIR, SEPA, EA, Defra, and Surfers against Sewage but has also drawn on a breadth of knowledge and experience from across the UK and the international community as well.

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Briefing Paper 1 concerned with Science, Regulation and Policy and **Briefing Paper 2** concerned with economics and public information can be viewed and downloaded from the DHW website www.deliveringhealthywater.net



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