ABHI

ABHI RESPONSE TO NICE CONSULTATION ON EVIDENCE STANDARDS FRAMEWORK

Submitted 29th April 2022

Q1: Overall, how strongly do you agree with the following statements on a scale of 1-5 (where 1 is strongly disagree, and 5 is strongly agree)?

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know
The purpose of the ESF is clear			X			
It is clear to me how the ESF fits into the digital health and innovation ecosystem			X			
The intended-use based ESF classification for DHTs makes sense		X				
The alignment of the ESF classification to the MHRA's regulatorys requirements for digital medical devices is clear						X
The 5 sections that the evidence standards have been grouped into are appropriate				X		
All relevant factors for the evaluation of digital and AI healthcare been covered in the ESF			X			

Q2: If you have any other comments or would like to explain any of your responses to Q1, please provide further detail here:

Proposed case studies will be useful.

Evaluations of DHTs face significant challenges whereby the traditional approach to evidence generation is often inappropriate. If the expectation is for the innovator to have generated all the evidence requirements outlined in the ESF prior to adoption, then this is an extremely high bar of evidence and investment which is unlikely to be pragmatic prior to implementation. This level of evidence is higher than currently required for NICE appraisals and could potentially acts as an additional barrier for innovators. This is acknowledged in the section on early deployment. To support innovation, it is therefore vital that maximum use is made of the early deployment framework. It is unclear/outside of the scope of the ESF how the decision to use the framework will happen in practice.

Due to the complex nature of care pathways within the NHS it's extremely unlikely that a single use case and proposed care pathway will be representative of all the ways in which the technology is likely to be used. To help with this the proposed case studies could be useful.

The ESF should address this explicitly and propose a collaborative approach to developing new care pathways, otherwise companies may assume that the onus is on them to develop a single proposed care pathway without interacting with the potential adopter which is likely to slow down the translation of the DHT into routine care with patients potentially missing out on effective technologies.
In terms of alignment with the MHRA, we are concerned as to whether it is confusing to commissioners to ask for and critique the same data which would be required and assessed by the regulator in order to mark the product as regulated. Our suggestion would be to remove everything from the ESF which would have already been assessed as part of the conformity assessment procedure for a medical device and require evidence of a CE/UKCA mark instead.
While in principle we support the high standards of evidence requirements proposed, we are concerned that they are too prescriptive for both innovators and commissioners and not sensitive to the challenges faced during evaluations of DHTs (https://pubmed.ncbi.nlm.nih.gov/32904379/). We also note that the lifespan of a typical DHT is limited due to system changes therefore this ESF may preclude some effective DHTs supporting the healthcare system and leading to healthcare benefit due to the timescales required to generate the body of evidence suggested here.
We urge NICE to assess whether this evidence framework could be presented in a more flexible, stage-gated way to encourage innovation and collaboration.

We think the level of evidence expected to be generated is likely suitable for a NICE assessment but excessive for local appraisal and in addition multiple local assessments repeating a similar assessment would be duplicative and resource intensive for both industry and commissioning organisations.

The evidence requirements on effectiveness and real-world evidence on the claimed benefits of the DHT, whilst clearly important, are unsuitable for early stage DHTs. We suggest that this is provided as a recommendation to support collaboration on post market data collection rather than a requirement for adoption.
It is also therefore vital that it is clearly and consistently communicated how and when the early deployment subset should be used.

Q3: Overall do you think that the evidence standards will allow the detection of DHTs with positive patient and system impact, without creating a barrier to innovation?

Yes	
No	X
Don't Know	

Please provide any additional comments below:
As described in our response to the previous question, we believe that the ESF as it stands could prove a barrier to innovation rather than a facilitator. It's unlikely that SMEs and start up digital companies will have the resources and expertise to develop the evidence required to satisfy the standards outlined in the ESF prior to return on investment via adoption. However, we could see it acting as an incentive for innovators if satisfying most of the pre-market evidence requirements outlined in the ESF lead to contingent approval with reimbursement associated for a specific length of time to support the local setting in capturing real world data on the impact of implementation.

The ESF alone won't necessarily achieve the objective, as this is intended to be deployed at a local level the implementation also needs consistent application of the standards and the necessary capacity and capability within commissioning organisations. We are concerned that evaluators, as defined in the user guide as NHS commissioners, buyers of DHTs and local evaluators, are unlikely to have the capacity and potentially expertise to conduct an appraisal of all the evidence that the ESF suggests is presented to them. Specifically, there is a clear lack of expertise in the field of clinical data science and professional bodies, as highlighted by The Topol Review (https://topol.hee.nhs.uk/). There is also a new initiative by Health Education England to develop this workforce, recognising that this lack of expertise is an issue.

Q4: We have described a subset of standards for early deployment (ED) of DHTs in evidence generation programmes. Does this approach meet the needs of early-stage DHTs and evaluators?

Yes	
No	
Don't Know	X

Please provide any additional comments below:
As outlined above, we have concerns that the ESF will prevent any implementation of DHT's prior to collecting all this evidence and considering the adaptive nature of some DHTs this would prevent any optimization of such technologies and therefore reduce their efficacy. It is therefore vital that the early deployment subset provides a route to market that is less onerous but still with necessary controls. See also answer to Q21
The ED subset should aim to harmonize with clinical trials groups and research study groups when creating standards to facilitate the pathway from research to deployment.

Design considerations

How strongly do you agree that these standards are relevant to the purpose of the ESF on a scale of 1-5 (where 1 is strongly disagree, and 5 is strongly agree)?

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know
1. Incorporate service user acceptability in the design of the DHT				X		
2. Consider environmental sustainability			X			
3. Consider health and care inequalities and bias mitigation				X		
4. Embed good data practices in the design of the DHT				X		
5. Define the level of professional oversight				X		

6. Show processes for creating reliable health information				X		
7. Show that the DHT is credible with UK professionals				X		
8. Provide safeguarding assurances for DHTs where service users are considered to be in vulnerable groups, or where peer-peer interaction is enabled				X		

If you would like to provide additional comments about any of the standards listed please select them below: (select all that apply)

1. Incorporate service user acceptability in the design of the DHT

We are concerned that if these aspects will have already been covered by a medical device conformity assessment procedure, they will be duplicative and add unnecessarily to the resource requirements for both industry and commissioners.

2. Consider environmental sustainability

While we agree in principle that this is an important consideration, we are concerned that there is no framework globally to understand how best to do this and so guidance is needed before mandating this is a requirement. As an example, AI can take up significant computing power resulting in bigger data centres and more power consumption i.e. negative impact to environment. Therefore, this standard needs to be balanced against the needs of complex high process/computer innovation.

We are concerned that if these aspects will have already been covered by a medical device conformity assessment procedure, they will be duplicative and add unnecessarily to the resource requirements for both industry and commissioners.

3. Consider health and care inequalities and bias mitigation

It would be helpful to provide or sign post to support tools in this area. For example, guidance on how to design development and validation studies to avoid algorithmic bias such as https://www.adalovelaceinstitute.org/our-work/programmes/ethics-accountability-practice/. Also any library of library of unbiased training data.

4. Embed good practices in the design of the DHT

'High quality' datasets are a little unclear, perhaps rephrase to 'similar probability distributions that are known'. The 'size' of the training and validation datasets should also state the 'probability distribution'. It would also be useful to describe what would not be acceptable.

We are concerned that if these aspects will have already been covered by a medical device conformity assessment procedure, they will be duplicative and add unnecessarily to the resource requirements for both industry and commissioners.

5. Define the level of professional oversight

Guidance on how to demonstrate and describe the level of professional oversight needed would be helpful. As per our previous point, the workforce in clinical data science does not yet exist in the NHS as there is not a professional body for these skills in the NHS.

We are concerned that if these aspects will have already been covered by a medical device conformity assessment procedure, they will be duplicative and add unnecessarily to the resource requirements for both industry and commissioners.

6. Show processes for creating reliable health information
'Relevant experts' are referred to in this standard, however, as described above, this workforce does not yet exist in the NHS so we would like clarity on who NICE mean here.

7. Show that the DHT is credible with UK professionals
Guidance on what the acceptable approaches are in showing that the DHT is credible with UK professionals (e.g., experts panel review) would be helpful

8. Provide safeguarding assurances for DHTs where service users are considered to be in vulnerable groups, or where peer-peer interaction is enabled

Describing value

How strongly do you agree that these standards are relevant to the purpose of the ESF on a scale of 1-5 (where 1 is strongly disagree, and 5 is strongly agree)?

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know
9. Describe the intended purpose and target population				X		
10. Describe the current pathway or system process				X		
11. Describe the proposed pathway or system process using the DHT				X		
12. Describe the health and system impacts and associated cost and resource impacts compared with standard or current care		X				

If you would like to provide additional comments about any of the standards listed please select them below: (select all that apply)

9 Describe the intended purpose and target population
Some companies may be developing broad platforms with multiple applications, the application of this standard needs to recognise this and not provide a barrier to creating such platforms which can support more integrate approaches and common user experiences
10. Describe the current pathway or system process
We note that even if there are guidelines to allow mapping of the current pathway, this will differ regionally and locally as it is dependent on local requirements and set up. This may be reflected during the validation with relevant health professionals in the UK therefore it would be helpful if the standard could pluralise 'current pathway' or note that there may be multiple

representative pathways or provide an example pathway which would be developed further in collaboration with the provider. Further guidance would be helpful.

11. Describe the proposed pathway or system process using the DHT
While we agree on the importance of this standard, we would suggest that some guidance is provided here to innovators. There are marked differences between services within and between different regions across the UK. Therefore, there will be nuanced differences to the potential new pathway which incorporates a novel technology. Therefore, we think some guidance here would be helpful in describing the requirements behind this standard as well as explicit consideration of the lack of single pathway within this standard. This will both guide innovators and manage expectations of commissioners on the levels of evidence required. It would be impossible for an innovator to provide details on all the ways in which the DHT could be used and therefore training and cost implications. However, if the standard stated that an example and probable pathway was described it would provide more clarity to the innovator on the expectations of this standard.
As described for 10, this would likely be developed in collaboration with the provider which is something which NICE should take the opportunity of the ESF to encourage to improve efficiency of R&D and translation into practice.

12. Describe the health and system impacts compared with standard or current care
While we agree with this in principle, we note there are huge challenges undertaking this type of work without collaboration with the healthcare system/provider. As noted in an earlier response, SMEs and start-up tech firms are unlikely to have the expertise, resources, or capacity to conduct this type of work and it really needs to be conducted in collaboration with the potential adopter to ensure the analysis accurately reflects the current and proposed new pathways within their healthcare system.
Additionally, the true health and system impacts are unlikely to be fully realised in the locale of the adopter without implementation of the DHT. We suggest that NICE make less strong recommendations on presenting such evidence to a likely adopter and propose a stage-gated, collaborative approach to generating such evidence.

Demonstrating performance

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know
13. Provide evidence of the DHT's performance to support its claimed benefits				X		
14. Additional evidence for critical conditions or functions			X			
15. Show real world data of performance in practice		X				
16. The company and evaluator should agree a plan for measuring changes in the DHT's performance over time			X			
17. The DHT should comply with relevant safety and quality standards				X		

If you would like to provide additional comments about any of the standards listed please select them below: (select all that apply)

13. Provide evidence of the DHT's performance to support its claimed benefits

14. Additional evidence for critical conditions or functions
We believe this is related to the technologies use case and therefore should form part of 13 –'evidence to support its claimed benefits'. There are no examples provided of critical conditions and functions and this could be subjective, so it would be more complete to include this within standard 13 and perhaps state use the level of risk that the DHT or condition has a way of categorising additional evidence requirements.

15. Show real world data of performance in practice
This requires implementation to demonstrate. This should be a recommendation post adoption but not a requirement for adoption. This is because the implementation will differ in different settings and therefore the evidence is unlikely to be transferable and the learning curve of a new technology requires a lead time to measure impact post pathway optimization. This additionally needs to be conducted collaboratively with the provider and therefore should not be solely the responsibility of the innovator.
In addition, this conflicts with the requirements for investigational devices, which can only be investigated in controlled studies, hence not real-world. This is because of the need for ongoing risk management (ISO14971) and for patient safety (ISO14155).
ISO14155, Appendix I also clearly states observational study designs for the post-market (after approval) phase only.

16. The company and evaluator should agree a plan for measuring changes in the DHT's performance over time
This assumes that the commissioning body will continue to evaluate and has the skill set to conduct this evaluation. While we agree this is required for DHTs including those with AI and machine learning capabilities, it sits among the evidence requirements so should either be an evidence requirement for the DHT or guidance and support for the commissioner on implementation to include re-evaluation. Also, we note that the standard explicitly states that the evaluator should agree on the plan but we suggest they should be independent from it. Again, it will be important to align the practice of this with the need for Post Market Surveillance and Clinical Follow-up required under regulation.

17. The DHT should comply with relevant safety and quality standards
These should be made clear by the healthcare system. This standard however should avoid duplication of regulatory assessments. No mention of the CE marking here which is effectively closing the UK NHS market to European companies, this should be included.

Delivering value

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know

18. Provide a budget impact analysis		X				
19. Show sensitivity analysis to explore uncertainties		X				
20. For DHTs with higher financial risk: provide a cost-comparison or cost-utility analysis			X			
21. Agree a data collection plan to show value		X				

If you would like to provide additional comments about any of the standards listed please select them below: (select all that apply)

18. Provide a budget impact analysis
Not currently required prior adoption of medical devices and IVDs so this seems extreme. We understand that locally these may be required, or more usually a business case, and can support when needed. Also, these are likely to be very local and pathway dependent particularly since technologies will be used in different ways dependent on local make up.

19. Show sensitivity analysis to explore uncertainties
see answer for 18. Additionally, we note that sensitivity analyses are not well suited for AI appraisals in this context. For example, in deep learning (a form of AI/ML) you cannot assume a linear input and output relationship and use this assumption therefore to quantify estimate uncertainty. The network architecture of these deep learning models often means that there are non-linear activation functions, so the idea of tweaking input variables to explore uncertainties estimates, as defined here in the doc: 'Explore the uncertainty of the estimate obtained from the budget impact analysis by varying the assumptions used (for example, using best- and worst-case values for target population size, resource use).' does not hold (for this form of DHT).

20. For DHTs with higher financial risk: provide a cost-comparison or cost-utility analysis
As 'higher financial risk' is to be determined at a local level and therefore presumably the evaluation also undertaken at that level we would seek to understand how it will be determined if the commissioners have the capacity and resources to critique this. Would there be a mechanism to flag these 'higher risk' deployments to NICE for a central assessment thereby also reducing duplicative efforts?

21. Agree a data collection plan to show value
If the ESF is to be used to inform the company what evidence it needs to provide to the commissioner to inform a commissioning decision then this does not really fit in here as this is a joint piece of work between the company and the healthcare system. Perhaps example plans could be provided by the company, but they will be unique to each local setting and should be developed collaboratively.

Deployment considerations

	1 - Strongly disagree	2	3	4	5 - Strongly agree	Don't know

22. Ensure transparency about requirements for deployment				X		
23. Describe plans for communication, consent and training processes in place to allow the DHT to be understood by end users				X		
24. Ensure appropriate scalability		X				

If you would like to provide additional comments about any of the standards listed please select them below: (select all that apply)

22. Ensure transparency about requirements for deployment
A full description of the input data for the DHT should include the statement that include a data dictionary'.

23. Describe plans for communication, consent and training processes in place to allow the DHT to be understood by end users
some of this might need to be done in collaboration with the healthcare provider. Again, duplication of the regulatory assessment should be avoided. It should be sufficient for the manufacturer to demonstrate assessment by a notified body through UKCA/CE marking.

24. Ensure appropriate scalability
This is difficult for DHTs and we would welcome guidance on demonstrating this

Early Deployment standards

	Include	Exclude	Don't know
1. Incorporate service user acceptability in the design of the DHT	X		
2. Consider environmental sustainability		X	
3. Consider health and care inequalities and bias mitigation	X		
4. Embed good data practices in the design of the DHT	X		
5. Define the level of professional oversight	X		
6. Show processes for creating reliable health information	X		
7. Show that the DHT is credible with UK professionals	X		
8. Provide safeguarding assurances for DHTs where service users are considered to be in vulnerable groups, or where peer-peer interaction is enabled	X		

Describing value

	Include	Exclude	Don't know

9. Describe the intended purpose and target population	X		
10. Describe the current pathway or system process	X		
11. Describe the proposed pathway or system process using the DHT	X		
12. Describe the health and system impacts and associated cost and resources impact compared with standard or current care		X	

Demonstrating performance

	Include	Exclude	Don't know
17. The DHT should comply with relevant safety and quality standards	X		

Delivering Value

	Include	Exclude	Don't know
21. Agree a data collection plan to show value		X	

Deployment considerations

	Include	Exclude	Don't know
23. Describe plans for communication, consent and training processes in place to allow the DHT to be understood by end service users		X	

Please provide any further comments relating to the Early Deployment standards below:

Many of the above (4, 5, 6, 9) overlap with regulatory approval and inclusion is proposed based on the ability to take the regulatory approval as demonstration of meeting the standard.

Overall, this section is difficult to understand without more context e.g. what these programmes are which support evidence generation for DHTs. It would be useful to provide links to these and to explicitly include the categorisation for each of these standards.

However, for an early DHT deployment we would suggest excluding the following as these would need to follow some evidence generation. Excluding: 12, 21, 23.