

## UK National Screening Committee

### Repeat screening for syphilis in pregnancy: A cost-effectiveness model

15 July 2020

#### Aim

1. To ask the UK National Screening Committee (UK NSC) to make a recommendation, based on the evidence presented in this document, whether or not repeat screening for syphilis in pregnancy should be introduced as a systematic population screening programme.

#### Background

2. Currently, routine screening for syphilis is offered to all pregnant women at their booking appointment, usually near the end of their first trimester.
3. In 2016/17 there were 4 isolated atypical cases of congenital syphilis (CS) in babies whose mothers had true negative screening results. Consequently, the UK NSC was asked to explore the value of a repeat screening strategy.
4. Aquarius Population Health were commissioned to assess whether it is clinically and cost effective to offer all pregnant women screening for syphilis in early pregnancy and again in the third trimester compared with current practice.
5. A decision tree model was developed assessing the incremental costs and health benefits of the two screening strategies. The primary outcome was cost per case of congenital syphilis prevented. Other outcomes were: cost per intrauterine fetal demise (IUFD), preterm birth and neonatal death prevented; cost per QALY (healthcare costs only, health and social care costs); and number needed to screen and treat.

#### Findings

6. The base case results indicate that in one year of screening pregnant women, the repeat screening strategy would result in 5.5 fewer cases of CS and cost £1,791,880 per case of CS prevented compared with single screening.
7. Additional benefits of repeat screening were small: 2 fewer cases of preterm delivery, 0.1 fewer cases of neonatal death and 0.3 fewer cases of IUFD.

8. 124,292 women would need to be rescreened in the third trimester to prevent one case of CS. 1,384 women would be diagnosed with syphilis and 1,372 would be false positive.
9. When lifetime costs and utilities were considered in the scenario analysis, the cost per additional QALY gained for the repeat screening strategy was £180,817 compared with single screening. If social care costs were also considered, the cost/QALY was £120,494. Caution is required in interpreting cost/QALY as there is uncertainty surrounding the long-term costs and QALYs of congenital syphilis.
10. The sensitivity analyses showed that the base case results were stable. The total cost of the repeat screening strategy was always higher than the cost of the single screening strategy.
11. The total costs were most sensitive to changes in the cost per screen.
  - When the cost per screen was halved (£6.68), the cost per CS case avoided was £961,594 for a repeat screening strategy compared with single screening. When long-term healthcare costs were considered, this equated to £93,096/QALY, and £32,774/QALY when social care costs were also considered. As above, cost/QALYs should be interpreted with caution.
12. The number of CS cases was most sensitive to the proportion of women becoming infected with syphilis during pregnancy.
  - At a higher incidence of syphilis during pregnancy (0.012% vs 0.0017% in baseline), repeat screening resulted in 39 fewer cases of CS compared with single screening, equating to £247,284 per CS case avoided.
  - Analyses showed that it may be cost effective (below the £20-30k NICE threshold) to introduce repeat screening if 1 in 25,000 (0.004%) or more women become infected with syphilis during pregnancy, when health and social-care costs are considered. This is a much higher incidence than the estimated average for pregnant women in the UK. Caution is required, as stated above.
13. It was concluded that implementation of universal repeat screening for syphilis in pregnancy should not be recommended as there is no evidence that it would be cost-effective in the current UK setting where the prevalence and incidence of syphilis in pregnant women is low.

#### **Public consultation**

14. A three-month consultation was hosted on the UK NSC website. Direct emails were also sent to 18 stakeholders (see Appendix 1 for list).



15. Four comments were received (see Appendix 2 for comments):

- The British Association for Sexual Health & HIV, the Royal College of Physicians and the Royal College of Midwives were in support of the conclusions of the model.
- The Royal College of Paediatrics and Child Health had no comments.

### **Recommendation**

16. The committee is asked to approve the following recommendation:

*Repeat screening for syphilis in pregnancy is not recommended as a systematic population screening programme in the UK.*

## **Appendix 1. Organisations/Experts contacted directly for the public consultation**

1. British Association for Sexual Health and HIV
2. British Infection Association
3. British Maternal & Fetal Medicine Society
4. Faculty of Public Health
5. Fiona McCormack
6. Institute of Child Health
7. National Infection Service (Public Health England)
8. NHS England & Improvement
9. NHS Infectious Diseases in Pregnancy Screening (IDPS) programme
10. Antenatal and Newborn Screening Programmes
11. Royal College of General Practitioners
12. Royal College of Midwives
13. Royal College of Obstetricians and Gynaecologists
14. Royal College of Paediatrics and Child Health
15. Royal College of Physicians
16. Royal College of Physicians and Surgeons of Glasgow
17. Royal College of Physicians of Edinburgh
18. Sam Cramond

## Appendix 2. Consultation comments

<b>Name:</b>	Dr David Phillips	<b>Email address:</b>	XXXX XXXX
<b>Organisation (if appropriate):</b>	BASHH (British Association for Sexual Health & HIV)		
<b>Role:</b>	General Secretary to the Board		
<b>Do you consent to your name being published on the UK NSC website alongside your response?</b>			
Yes			
<b>Section and / or page number</b>	<b>Text or issue to which comments relate</b>	<b>Comment</b>	
		<i>Please use a new row for each comment and add extra rows as required.</i>	
	<b>General Methodology and outcomes</b>	<p>We welcome that this health economic model has been performed as those of us working in areas with increasing numbers of young women diagnosed with early syphilis in pregnancy can develop a distorted overall picture of what is really happening throughout the UK.</p> <p>We cannot see any significant problems in the model that has been used or the assumptions regarding the adverse outcomes of syphilis in pregnancy. We agree with the recommendations that implementation of universal repeat screening for syphilis in pregnancy is not recommended as it would not be cost-effective in view of the low current prevalence and incidence of syphilis in pregnant women. In addition, one must consider the additional cost in terms of anxiety for women having to have a second test, particularly because the tests are imperfect and can lead to false positives that require confirmation.</p> <p>Perhaps the most useful part of the analysis is the modelling of the impact of rescreening at future higher incidences of syphilis i.e. in trimester screening would need to be 1 in</p>	

		<p>25,000 (0.004%) or more before repeat screening becomes cost-effective. This means those in areas of higher incidence can monitor their incidence to assess if it is rising to near that level, where further cost-effectiveness calculations may be needed.</p> <p>It is a pity that it is not possible to do an analysis of the impact of targeted re-testing but we would agree that this is done poorly at present and there is no way of monitoring current practice. We believe this it was worthy work and that the UK National Screening Committee should be commended for commissioning it. If cases of congenital syphilis continue to rise it will need re-evaluating.</p>
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Please return to the UK NSC Evidence Team at [screening.evidence@nhs.net](mailto:screening.evidence@nhs.net) by 11 May 2020

<b>Name:</b>	Mervi Jokinen	<b>Email address:</b>	XXXX XXXX
<b>Organisation (if appropriate):</b>	The Royal College of Midwives		
<b>Role:</b>	Professional advisor		
<b>Do you consent to your name being published on the UK NSC website alongside your response?</b>			
Yesx      No			
<b>Section and / or page number</b>	<b>Text or issue to which comments relate</b>	<b>Comment</b>	
		<i>Please use a new row for each comment and add extra rows as required.</i>	
<b>Executive summary page 5</b>	Conclusion and recommendation Based on the results of this analysis, we would not recommend implementation of universal repeat screening for syphilis in pregnancy as there is no evidence that it would be cost effective in the current UK setting where the prevalence and incidence of syphilis in pregnant women is low. Repeat screening could also have some potential harms, including overtreatment with antibiotics and unnecessary anxiety, which the model did not account for.	Royal College of Midwives (RCM) welcomes the opportunity to review <i>'the repeat screening for syphilis in pregnancy as an alternative screening strategy in the UK - a cost-effectiveness analysis'</i> report. In view of the modelling and analysis undertaken the RCM supports the conclusion and recommendation of not adding repeat screening into the current programme.	

Please return to the UK NSC Evidence Team at [screening.evidence@nhs.net](mailto:screening.evidence@nhs.net) by 11 May 2020



**From:** Rochelle Keenaghan <XXXX XXXX>  
**Sent:** 12 May 2020 14:23  
**To:** EVIDENCE, Screening (PUBLIC HEALTH ENGLAND) <XXXX XXXX>  
**Cc:** XXXX XXXX; Consult <XXXX XXXX>  
**Subject:** UK NSC Syphilis Consultation Open

Dear all

The RCP is grateful for the opportunity to respond to the above consultation.

We have liaised with the BASHH and would like to comment as below, with apologies for the delayed response.

It is unsurprising that it is not cost-effective to rescreen pregnant women for syphilis when the incidence of syphilis in women in England is so low. We cannot see any significant problems with the model or the assumptions regarding the adverse outcomes of syphilis in pregnancy.

Our experts note that it is a pity that it is not possible to do an analysis of the impact of targeted retesting would agree that this is done poorly at present and there is no way of monitoring current practice.

Perhaps the most useful part of the analysis is the modelling of the impact of rescreening at future higher incidences of syphilis. This will help in identifying the thresholds of syphilis incidence in women at which the question of repeat screening can be revisited.

I would be grateful if you could please confirm whether these comments can be accepted.

Best wishes

**Rochelle Keenaghan | Consultation support manager**  
**Membership Support and Global Engagement Department | Royal College of Physicians**

XXXX XXXX | XXXX XXXX XXXX XXXX

Please note that this email is not always monitored as I work flexibly and part time. For consultation issues please email XXXX XXXX or for urgent issues email XXXX XXXX or call Simon on XXXX XXXX.



**From:** Clinical Standards <XXXX XXXX>

**Sent:** 11 May 2020 12:36

**To:** EVIDENCE, Screening (PUBLIC HEALTH ENGLAND) <XXXX XXXX>

**Subject:** UK NSC Syphilis Consultation

Good Afternoon,

Thank you for inviting the Royal College of Paediatrics and Child Health to comment on the screening for syphilis in early pregnancy review. Please note that we have not received any responses for this consultation.

I would be grateful if you could please acknowledge receipt.

Kindest regards,

Charlotte

**Charlotte Jackson**

**Clinical Guidelines Assistant**

Royal College of Paediatrics and Child Health

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